UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 1

JANUARY 5 - - - 1934

IN THIS ISSUE

Analytical Summary of the Influenza Epidemic of 1928–29
Deaths in Large Cities During the Week Ended December 16
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON · 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - Price, 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health

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CONTENTS

Page

The influenza epidemic of 1928–29 in 14 surveyed localities in the United States—An analysis, according to age, sex, and color, of the records of morbidity and mortality obtained in the surveys ... 1

Deaths during week ended December 16, 1933

Deaths and death rates for a group of large cities in the United States ... 42

Death claims reported by insurance companies ... 42

PREVALENCE OF DISEASE

United States:

Current weekly State reports:

Reports for weeks ended December 23, 1933, and December 24, 1932 ... 43

Summary of monthly reports from States ... 45

Weekly reports from cities:

City reports for week ended December 16, 1933 ... 47

Foreign and insular.

Canada—Quebec Province—Communicable diseases—2 weeks ended December 16, 1933 ... 50

Cuba—Habana—Communicable diseases—4 weeks ended December 2, 1933 ... 50

Italy—Communicable diseases—4 weeks ended June 25, 1933 ... 50

Poland—Communicable diseases—1928–30 ... 51

Cholera, plague, smallpox, typhus fever, and yellow fever—

Cholera ... 51

Plague ... 51

Yellow fever ... 52

PUBLIC HEALTH REPORTS

VOL. 49 JANUARY 5, 1934 NO. 1

THE INFLUENZA EPIDEMIC OF 1928-29 IN 14 SURVEYED LOCALITIES IN THE UNITED STATES

An Analysis, According to Age, Sex, and Color, of the Records of Morbidity and Mortality Obtained in the Surveys [1]

By SELWYN D. COLLINS, *Senior Statistician, United States Public Health Service*

CONTENTS

Chronology
Representativeness of the canvassed population
Case incidence of influenza, grippe, and colds.
The frequency of pneumonia as a complication
Mortality and case fatality.
Summary.
Acknowledgments.

Immediately following the influenza epidemic of the winter of 1928-29, the Public Health Service made surveys in 10 large cities and in 4 groups of rural communities to determine the extent of illness from influenza and other minor respiratory diseases. The general method of the surveys and the data for the 14 localities considered as a whole have already been published (1). In the present paper it is intended to consider the general aspects of the epidemic in each of the localities that were surveyed. Although the average results for all localities are of interest, information on the variation from place to place in the extent and severity of respiratory conditions probably adds as much to the knowledge of the nature of such epidemics as do the average results for all places.

In arrangement the present paper follows that of a similar study by the Public Health Service of the extent and severity of the 1918-19 epidemic in 12 localities surveyed at that time (2).

[1] From the Office of Statistical Investigations, U S. Public Health Service

CHRONOLOGY

In each locality respiratory sickness was recorded as influenza, grippe, pneumonia, and colds (insofar as the family informant remembered them) for an average period of about 2½ months, the period varying from about 9 to 14 weeks in the different communities.

Figure 1 shows for each locality the case rate per 1,000 persons canvassed for each week for which sickness was recorded.[2] The canvassed population of each city comprises a total of 10,000 to 15,000 persons living within 10 to 20 districts scattered throughout the city. The numbers of deaths in the surveyed populations of the various cities were small, but they can be supplemented by records of mortality from influenza and pneumonia for the city as a whole Figure 1 includes weekly mortality from influenza and pneumonia (broken line) in the city as a whole for the weeks during which influenza was epidemic. To indicate the extent of the excess mortality during these epidemic weeks over what usually occurred in preceding years, there is plotted a weekly expected or normal death rate (dotted line) which is based on the median rate for corresponding weeks of the 7 years 1921–27. There are no data for preceding years to indicate the expected sickness rate, and the dotted line for the expected mortality is in no way applicable as an indication of what the expected illness rate would be. The sole purpose of plotting morbidity and mortality on the same graph is to indicate that the apparently high sickness rate was paralleled by an excess in the mortality from influenza and pneumonia in these cities.

[2] The illness curves refer to the cases of influenza, grippe, pneumonia, and colds in bed It might be said, however, that the deduction of colds in bed from this group of respiratory causes does not materially change the picture of the epidemic in the various cities. (See table 1)

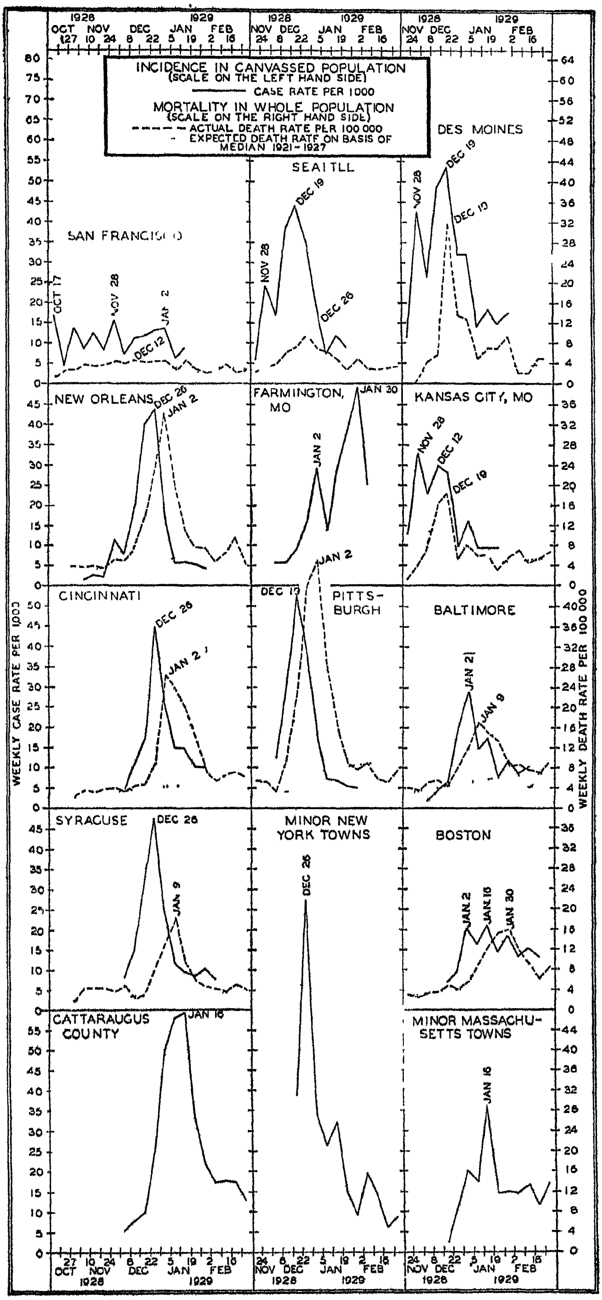

Figure 1.—Weekly incidence of respiratory cases and of mortality from influenza and pneumonia in each surveyed locality during the epidemic of 1928–29 Dates are middle (Wednesday) of peak weeks Respiratory cases include influenza, grippe, pneumonia, and colds in bed

TABLE 1.—*Weekly incidence of respiratory diseases during the epidemic of 1928–29 in canvassed families in certain localities in the United States*

[Weekly[1] case rates per 1,000 persons canvassed]

Week ending—	Influenza, grippe, pneumonia, and colds in bed	Influenza, grippe, and pneumonia	Colds in bed	Influenza, grippe, pneumonia, and colds in bed	Influenza, grippe, and pneumonia	Colds in bed	Influenza, grippe, pneumonia, and colds in bed	Influenza, grippe, and pneumonia	Colds in bed	Influenza, grippe, pneumonia, and colds in bed	Influenza, grippe, and pneumonia	Colds in bed
	San Francisco			Seattle								
Oct 20	16 8	14 8	2 0									
27	4 5	4 1	4									
Nov 3	13 6	12 3	1 3									
10	8 5	7 4	1 1									
17	12 4	10 4	2 0									
24	8 4	7 6	8	5 6	4 1	1 5						
Dec 1	15 6	12 5	3 1	24 0	18 7	5 3						
8	7.3	6 0	1 3	16 8	15 1	1 7						
15	11 2	8 6	2 6	38 2	31 2	7 0						
22	11 8	8 9	2 9	44 3	37 1	7 2						
29	13 2	10 3	2 9	35 2	29 6	5 6						
Jan 5	13 6	10 0	3 6	19 0	14 6	4 5						
12	6 3	5 0	1 3	7 4	5 5	1 9						
19	8 8	5 1	3 7	11 8	9 2	2 6						
26	------	------	------	9 1	5 9	3 2						
	Des Moines			Kansas City, Mo			Farmington, Mo			New Orleans		
Nov 10	------	------	------	------	------	------	------	------	------	1 2	1 1	0 1
17	------	------	------	------	------	------	------	------	------	2 5	2 3	.2
24	11 2	10 5	0 7	12 9	10 1	2 8	------	------	------	1 8	1 7	.1
Dec 1	42 5	38 9	3 6	32 9	27 1	5 8	------	------	------	11.3	10 3	1.0
8	26 2	24 8	1 4	22 6	18 1	4 5	5 7	4 9	0 8	7 7	5.9	1 8
15	48.5	43 7	4 8	29 8	24 3	5 5	5 7	3 3	2 5	19 6	17 6	2 0
22	53.6	48 6	5 0	28.2	22 4	5 8	9 0	7 4	1 6	39 8	35 4	4 4
29	31 7	29 8	1 9	19 2	16 2	3 2	16 3	13 1	3 3	43 6	38 5	5 1
Jan 5	31 5	27 3	4 2	16 2	12 2	4 0	29 4	16 3	13 1	16 6	14.5	2 1
12	14 0	12 3	1 7	9 3	7 8	1 5	13 9	11 4	2 5	5 5	5 0	.5
19	18 2	14 6	3 6	9 2	6 4	2 8	28 6	20 4	8 2	5 6	5 1	.5
26	14 6	11 3	3 3	9 3	5 3	4 0	38 4	30 2	8 2	5 2	4 1	1.1
Feb 2	17.2	13 6	3 6	------	------	------	49 0	31 0	18 0	4.0	2 9	1 1
9	------	------	------	------	------	------	25 3	13.1	12 3	------	------	------

[1] In some localities the first and last weeks are based on 4 to 6 days' data, but the rates have been raised to a 7-day, or weekly, basis Cases were tabulated only to the day canvass was begun, and so total surveyed population is under observation for every week

TABLE 1.—*Weekly incidence of respiratory diseases during the epidemic of 1928–29 in canvassed families in certain localities in the United States*—Continued

Week ending—	Pittsburgh: Influenza, grippe, pneumonia, and colds in bed	Pittsburgh: Influenza, grippe, and pneumonia	Pittsburgh: Colds in bed	Syracuse: Influenza, grippe, pneumonia, and colds in bed	Syracuse: Influenza, grippe, and pneumonia	Syracuse: Colds in bed	Cattaraugus County: Influenza, grippe, pneumonia, and colds in bed	Cattaraugus County: Influenza, grippe, and pneumonia	Cattaraugus County: Colds in bed	Minor New York Towns: Influenza, grippe, pneumonia, and colds in bed	Minor New York Towns: Influenza, grippe, and pneumonia	Minor New York Towns: Colds in bed
Dec 8	12.2	9.3	2.9	7.2	6.1	1.1	5.4	3.9	1.5			
15	31.0	25.7	5.3	14.9	11.5	3.4	7.9	6.9	1.0			
22	52.1	40.2	11.9	31.6	26.0	5.6	9.9	7.7	2.2	38.8	36.6	2.2
29	37.1	29.9	7.2	47.5	38.2	9.3	25.0	20.3	4.7	87.0	83.1	3.9
Jan 5	18.2	13.6	4.6	24.4	16.6	7.8	49.7	43.3	6.4	34.0	29.7	4.3
12	7.2	4.9	2.3	11.6	7.8	3.8	58.2	50.8	7.4	26.3	22.4	3.9
19	6.7	4.7	2.0	9.5	5.3	4.2	59.1	52.2	6.9	32.3	26.7	5.6
26	5.3	3.1	2.2	8.6	5.3	3.3	32.9	28.7	4.2	14.2	13.8	.4
Feb 2	4.9	2.4	2.5	10.3	5.3	5.0	21.8	19.1	2.7	9.0	8.1	.9
9	--------	--------	------	7.8	2.4	5.4	17.1	15.1	2.0	19.4	15.9	3.5
16	--------	--------	------	--------	--------	------	17.6	15.1	2.5	14.2	11.2	3.0
23	--------	--------	------	--------	--------	------	17.1	12.4	4.7	6.5	3.9	2.6
Mar 2	--------	--------	------	--------	--------	------	12.9	8.2	4.7	8.6	5.6	3.0

Week ending—	Cincinnati: Influenza, grippe, pneumonia, and colds in bed	Cincinnati: Influenza, grippe, and pneumonia	Cincinnati: Colds in bed	Baltimore: Influenza, grippe, pneumonia, and colds in bed	Baltimore: Influenza, grippe, and pneumonia	Baltimore: Colds in bed	Boston: Influenza, grippe, pneumonia, and colds in bed	Boston: Influenza, grippe, and pneumonia	Boston: Colds in bed	Minor Massachusetts Towns: Influenza, grippe, pneumonia, and colds in bed	Minor Massachusetts Towns: Influenza, grippe, and pneumonia	Minor Massachusetts Towns: Colds in bed
Dec 8	4.6	3.9	0.7	1.9	1.6	0.3						
15	10.9	9.3	1.6	4.4	3.5	.9						
22	17.2	13.7	3.5	6.3	5.4	.9	6.6	4.9	1.7	2.4	1.6	0.8
29	44.6	37.2	7.4	20.3	17.3	3.0	9.4	6.1	3.3	10.8	8.6	2.2
Jan 5	26.1	19.9	6.2	28.7	24.3	4.4	20.3	14.2	6.1	20.3	16.2	4.1
12	14.9	11.3	3.6	14.5	12.2	2.3	16.3	10.7	5.6	17.3	13.7	3.6
19	14.8	10.6	4.2	17.3	15.1	2.2	20.8	13.6	7.2	36.1	28.0	8.1
26	10.1	7.3	2.8	7.5	6.3	1.2	14.1	9.6	4.5	14.4	11.3	3.1
Feb. 2	9.0	5.7	3.3	11.9	9.1	2.8	18.3	12.8	5.5	14.8	11.9	2.9
9	--------	--------	------	8.6	7.3	1.3	13.4	9.2	4.2	14.5	11.1	3.4
16	--------	--------	------	10.3	7.1	3.2	15.4	7.9	7.5	16.7	13.1	3.6
23	--------	--------	------	--------	--------	------	13.3	6.8	6.5	11.7	8.7	3.0
Mar. 2	--------	--------	------	--------	--------	------	--------	--------	------	17.2	11.0	6.2

Week ending—	Great Barrington, Mass: Influenza, grippe, pneumonia, and colds in bed	Great Barrington, Mass: Influenza, grippe, and pneumonia	Great Barrington, Mass: Colds in bed	Palmer, Mass: Influenza, grippe, pneumonia, and colds in bed	Palmer, Mass: Influenza, grippe, and pneumonia	Palmer, Mass: Colds in bed	Saugus, Mass: Influenza, grippe, pneumonia, and colds in bed	Saugus, Mass: Influenza, grippe, and pneumonia	Saugus, Mass: Colds in bed	Nantucket, Mass: Influenza, grippe, pneumonia, and colds in bed	Nantucket, Mass: Influenza, grippe, and pneumonia	Nantucket, Mass: Colds in bed
Dec. 22	1.6	1.2	0.4	2.7	1.1	1.6	1.2	0.8	0.4	4.0	3.2	0.8
29	17.8	15.6	2.8	7.8	6.2	1.6	9.9	7.9	2.0	7.5	5.1	2.4
Jan 5	32.0	23.3	8.7	13.3	10.9	2.4	20.5	17.7	2.8	15.5	12.7	2.8
12	29.6	25.3	4.3	15.3	10.2	5.1	10.6	8.2	2.4	13.5	11.1	2.4
19	54.5	39.9	14.6	25.5	19.6	5.9	22.9	18.6	4.3	41.7	34.2	7.5
26	13.0	9.8	3.2	13.3	9.8	3.5	14.6	12.6	2.0	16.7	13.1	3.6
Feb 2	14.2	10.2	4.0	19.6	17.2	2.4	17.0	13.8	3.2	8.3	6.3	2.0
9	18.2	13.5	4.7	18.4	13.7	4.7	10.3	9.9	.4	11.1	7.5	3.6
16	11.9	8.3	3.6	27.4	21.9	5.5	13.0	10.2	2.8	14.3	11.5	2.8
23	7.9	3.9	4.0	18.0	16.4	1.6	10.3	7.9	2.4	10.7	6.7	4.0
Mar. 2	13.0	6.7	6.3	20.8	14.1	6.7	25.2	16.9	8.3	9.5	5.9	3.6
9	--------	--------	------	6.7	3.6	3.1	12.6	10.2	2.4	7.1	3.5	3.6
16	--------	--------	------	--------	--------	------	11.0	7.8	3.2	16.7	8.4	8.3
23	--------	--------	------	--------	--------	------	13.0	7.1	5.9	--------	--------	------

TABLE 2.—*Weekly death rates from influenza and pneumonia in the whole population of each of the 10 surveyed cities during the epidemic of 1928–29*

[Deaths classified according to date of death]

Week ending—	All 10 cities [1]	San Francisco	Seattle	Des Moines	Kansas City, Mo	New Orleans	Cincinnati	Pittsburgh	Baltimore	Syracuse	Boston
	Actual weekly death rate per 100,000										
1928											
Nov 3	2 48	2 90	2 00	2 15	2 80	3 72	2 42	1 92	2 05	1 52	2 13
10	2 57	3 91	1 30	71	1 28	3 72	3 62	2 95	2 05	4 01	1 50
17	2 83	3 24	79	71	1 02	3 95	2 90	4 14	3 21	4 01	2 74
24	3 15	3 74	2 09	0	1 28	3 03	3 62	5 18	3 95	4 01	2 99
Dec 1	3 58	4 43	2 86	0	4 08	4 87	3 85	5 04	3 61	3 51	2 38
8	4 10	3 59	3 89	4 28	6 88	4 64	3.13	3.11	4 68	4 51	2 99
15	6 10	4 60	6 25	5 72	16 32	6 50	4 10	8 44	5 16	2 01	3 24
22	11 18	4.08	7 29	31 39	18 35	13 69	4.33	23 53	4 20	3 01	4 74
29	13 52	4 43	9 90	13.56	5.35	22 53	8 44	43 36	8 17	8 02	3 99
1929											
Jan 5	17 89	4 43	7 29	12 85	8 15	33 91	26 04	48 98	11 53	13 02	5 37
12	13 80	2 72	6 25	5 01	5 87	19 50	23 15	28 27	16 82	18 01	8 86
19	10 94	4.78	4 95	7 13	6 64	11 14	19 29	16 72	14 88	9 51	11 99
26	8 24	2 90	2 86	7 13	3 82	7 44	13 02	8 73	12 90	5 50	15 09
Feb. 2	7 42	2 05	4 68	9 28	5 87	7 19	7 23	7 56	8 17	4 51	15 84
9	6 13	2.72	3 13	2 15	7 13	4.64	5 06	8 73	8 65	4 01	11 99
16	5 42	3 91	2 86	2 15	4 58	6 04	6 50	5 48	7 69	3 51	8 98
23	5 58	2.05	3 13	5 01	5 10	9 53	6 75	5 18	6 96	5 01	6 12
Mar 2	5 69	2 55	3 38	5 01	6 64	4 18	5 79	7 10	8 65	4 01	8 36
9	5 20	2 05	4 68	1 42	3 57	6 73	7 00	8 00	6 37	5 01	5 73
16	4 78	1 53	2 09	1 42	6 64	5 81	5 54	6 81	6 00	6 50	4 99
23	4.76	1.19	1 30	3 57	4.85	1 63	5 54	6 65	4 93	5 01	5 12
30	3 66	2 05	79	2 15	5 35	3 95	3 13	5 33	3 84	5 01	4 37
Apr 6	3 67	2 05	1 04	2.86	4 85	4 87	4 10	4 30	4 79	7 00	1 38
	Excess [2] weekly death rate per 100,000										
1928											
Nov 3	−0 06	[3] +1 11	+0 84	+0.38	+0 40	+0 84	+0 27	−2 59	−0 73	−0 31	−0 17
10	− 06	+2 05	+ 02	−1.19	−1 21	+ 61	+1 23	−1.84	−.96	+2 09	−.96
17	+ 03	+1 28	− 56	−1 35	−1 67	+ 65	+ 31	− 94	+ 02	+1 99	+ 13
24	+.18	+1 63	+ 65	−2 21	−1 50	− 46	+ 75	− 20	+ 56	+1.90	+ 21
Dec 1	+ 44	+2 22	+1 32	−2 35	+1 15	+1 19	+ 69	− 61	+.02	+1 30	− 59
8	+ 78	+1 28	+2 30	+1 77	+3 82	+ 77	− 23	−2 80	+ 84	+2 17	−.17
15	+2 60	+2 11	+4 56	+3 08	+13 10	+2 47	+ 56	+2.26	+1 09	− 42	−.15
22	+7.49	+1 40	+5 56	+28 69	+15 00	+9 44	+ 59	+17 01	− 15	+.42	+1 19
29	+9 62	+1 52	+8 07	+10 71	+1.80	+18 07	+4 51	+36 55	+3 47	+5 33	+ 25
1929											
Jan 5	+13 77	+1.23	+5 41	+9 88	+4 32	+29 21	+22 02	+41 88	+0.44	+10 24	+1.44
12	+9 46	− 71	+4.33	+1 90	+1.80	+14 42	+19 02	+20 85	+11 35	+15 13	+4.79
19	+6 39	+1 23	+2 93	+3.88	+2.32	+5 77	+15 07	+8 96	+9 03	+6.50	+7.81
26	+3 53	−.65	+.79	+3.79	− 69	+1 69	+8 71	+ 67	+6 88	+2 44	+10 84
Feb 2	+2.56	−1 50	+2 57	+5.88	+1.07	+1 15	+2.82	−.79	+1.86	+1 34	+11 53
9	+1 14	−.79	+ 96	−1.35	+2 15	−1 69	+.56	+ 15	+2.19	+ 75	+7.63
16	+ 34	+ 46	+ 65	−1 40	− 59	−.38	+1 90	−3 38	+1 11	+ 15	+4 56
23	+ 44	−1.21	+.92	+1 42	−.36	+3.11	+2 09	−3 93	+ 25	+1 55	+1 67
Mar 2	+ 49	− 58	+1.17	+1 37	+ 92	−2 15	+1 05	−2 24	+1 90	+ 46	+3 82
9	0	−.92	+2.47	−2 27	−2 34	+ 69	+2.17	−1 50	−.35	+1.36	+1 13
16	− 14	−1.19	− 12	−2 27	+.59	+ 06	+ 71	−2 68	− 61	+2 86	+ 38
23	−1.06	−1 50	− 81	− 12	−1.10	−3 64	+ 75	−2.74	−1.50	+1 42	+.52
30	−1 15	−.54	−1 23	−1 56	− 50	− 84	−1 48	−3 74	−2.21	+1.55	− 13
Apr 6	−1 01	− 44	−.84	−.88	− 71	−.65	− 25	−4.33	−.81	+3.74	−2.88

[1] The rates for the 10 cities combined are weighted averages of rates for corresponding weeks for the individual cities, the weights being proportional to the size of the canvassed population in the different cities This method was followed to put the rates in the whole population for all cities on the same basis as those for the canvassed population in all cities

[2] The excess rates are deviations from an expected rate computed from median monthly rates for the period 1921–1927, as follows. For each city the median rates for the different months were plotted and a smooth line drawn to pass through all of the 12 monthly medians except the very irregular points From this line representing the seasonal curve of mortality from influenza and pneumonia, the approximate medians for each week were read. In the case of Des Moines, which was not in the registration area during all of this 7-year period, averages of monthly rates for the calendar years 1924, 1925, and 1927 were used instead of medians

[3] Excess rates for San Francisco for weeks prior to those shown in this table were as follows Oct. 27, +1.09; Oct 20, −0.02, Oct 13, −0 49; Oct. 6, −0 44

Data from current weekly reports from cities as published in the Public Health Reports For more details on deaths see notes to table 17.

In every one of the surveyed communities except San Francisco the incidence of respiratory diseases rises rather sharply to a definite peak, after which it declines about as sharply to the level of approximately 10 weeks previous. In Seattle, Des Moines, and Kansas City there is an early peak followed by another about 2 or 3 weeks later. In Seattle and Des Moines the second peak is distinctly the larger one, but in Kansas City the first is slightly greater than the second. In San Francisco there is little indication of any definite peak at any time covered by the survey. The mortality in San Francisco as a whole likewise shows only a very small excess over the expected rate

In each city the sickness records cover only the weeks during which respiratory diseases seemed to be unusually prevalent, and it is impossible to combine the data for all of the cities and get a sickness record by weeks for the whole period of the epidemic. In table 3 the communities have been combined into three groups, designated as (*a*) West and West Central, (*b*) East Central and East, and (*c*) New England. The West and West Central group consists of San Francisco, Seattle, Des Moines, and Kansas City, and the peaks in their death rates came the last half of December. The East Central and Eastern group consists of New Orleans, Cincinnati, Pittsburgh, Baltimore, and Syracuse, and in all of these cities the peak in the death rate came in the first half of January. The New England group consists of Boston and four minor towns in Massachusetts, with a peak in the death rate during the last half of January The grouping was suggested not solely by geographic location but by the fact that the peak of the epidemic came at different times in the three groups.

TABLE 3.—*Weekly incidence of different respiratory diagnoses reported during the epidemic of 1928–29 in 3 groups of canvassed localities*

Week ending—	Weekly case rate per 1,000 persons canvassed (cases classified according to date of onset)								Weekly mortality rate from influenza and pneumonia per 100,000 population (deaths classified according to date of death)		
	Influenza, grippe, pneumonia, and colds in bed	Influenza	Grippe	Total pneumonia	Influenza-pneumonia	Pneumonia, unqualified	Colds in bed	Colds not in bed	In canvassed population	In whole population of surveyed cities[1]: Actual rate	In whole population of surveyed cities[1]: Expected rate based on median 1921–27
	West and West Central[2] (46,605 persons canvassed)										
1928											
Nov. 24	9 3	7 3	0 4	0 17	0 15	0 02	1 4	3 0	--------	2 00	2 14
Dec 1	27 1	20.9	1 2	64	41	24	4 3	7 8	4 3	3 02	2 25
8	17 0	13 8	5	49	43	06	2 1	3 4	4 3	4 54	2 36
15	29.8	23.5	8	67	45	21	4.8	7 2	10 7	7 82	2.51
22	32.3	25 7	1 2	36	26	11	5 0	9 8	12 9	14 03	2 62
29	23.9	18 7	1 2	51	36	15	3 4	9 7	8 6	7 88	2 80
1929											
Jan 5	19 2	13.5	1 2	45	30	15	4 1	13 3	6.4	7 76	2 90
12	8 9	6 5	.6	15	11	.04	1 6	5 4	12 9	4 71	3 16
19	11 6	7.5	.7	24	11	.13	3 2	8.8	10.7	5 75	3 31
	East Central and Eastern[3] (69,385 persons canvassed)										
1928											
Dec 8	6 7	3 4	1 7	0 22	0 09	0 13	1 4	2 1	--------	4 04	4.02
15	16.4	9.4	4 1	33	17	16	2 6	4 1	5 8	5.58	4 22
22	29 6	16 3	7 1	88	52	.36	5 3	7 2	13 0	10 69	4 47
29	37 4	19 1	11 0	1 15	66	.49	6 1	9 2	23 1	19.62	4.70
1929											
Jan. 5	22.6	9 5	7 6	78	43	.35	4 8	6 7	24.5	27 80	4 95
12	10 5	4 2	3 5	48	22	26	2 4	3.9	17 3	21.24	5.23
19	10 7	4 0	4 0	26	14	.12	2 4	5 3	7 2	14 29	5.49
26	7 1	2 4	2 5	20	09	12	2 0	3.4	10 1	9.57	5.72
Feb 2	7.9	2.0	2 9	17	03	14	2 8	6 7	7 2	7.10	5 95
	New England[4] (27,616 persons canvassed)										
1928											
Dec 22	5 0	1 2	2 2	0 29	0 11	0.18	1.4	2 1	3.6	4 74	3.55
29	9 9	2 6	4 1	36	.11	25	2.9	3 0	7 2	3 99	3 74
1929											
Jan. 5	20.3	4 6	9 6	.62	.33	29	5 4	6.0	--------	5 37	3 93
12	16.7	3 9	7 4	54	14	.40	4.8	4 0	--------	8 86	4.07
19	26 4	4 8	13 6	58	18	40	7 5	8.0	14.5	11 99	4 18
6	14 2	3 0	7 1	.18	--------	.18	4 0	4 1	10 9	15 09	4 25
Feb 2	17 0	2 8	9 2	51	22	29	4 5	5 4	--------	15.84	4.31
9	13 8	1 6	7.9	51	11	40	3.9	4 0	7 2	11 99	4 36
16	15 9	2 1	7 2	.47	14	33	6 1	6 0	3.6	8.98	4 42
23	12 7	2 1	5 4	18	11	07	5.2	8 4	3 6	6.12	4 45

[1] The mortality rates for the whole population for the groups of cities are weighted averages of rates for corresponding weeks for the individual cities, the weights being proportional to the size of the canvassed population in the different cities This method was followed to put the rates for the whole population on the same basis as those for the canvassed population Data from current weekly reports from cities as published in the Public Health Reports

[2] San Francisco, Seattle, Des Moines, and Kansas City

[3] New Orleans, Cincinnati, Pittsburgh, Baltimore, and Syracuse

[4] Boston and the 4 minor Massachusetts towns, except that the figures in the last 2 columns for mortality in the whole population are for Boston only.

In figure 2 weekly case rates for the various specific diagnoses have been plotted for the three groups of cities. In the West and West Central few cases were designated as grippe, but in New England grippe was reported more frequently than influenza Of more importance than this difference in terminology is the fact that cases designated as grippe tended to rise to a peak in the same week as influenza, and cases reported as colds, whether or not the patient was in bed, also came to a peak in the week of the influenza peak. This is most clearly shown in the East Central and Eastern cities, but it is also indicated in the other two groups in which there is a tendency for two or more small peaks; the cases reported as colds usually show subsidiary peaks in the same weeks as the cases reported as influenza or grippe In view of the time correspondence in the peaks of the various diagnoses, it does not seem reasonable in the study of the results of these influenza surveys to disregard completely cases reported as colds In the majority of the tabulations the more severe colds that caused the patient to go to bed are included with influenza and grippe In a very high percentage of the influenza and grippe cases the patient was in bed.

The middle section of figure 2 shows weekly pneumonia case rates in each of the three groups of cities Some of the pneumonia cases were definitely designated as influenza-pneumonia, but a large proportion of them was reported as pneumonia without any information as to whether it followed influenza. It will be seen that the weekly incidence of both categories of pneumonia was similar. The similarity is particularly marked in the East Central and Eastern cities. This group covers a larger population and the cities in it tended to have more definite and higher peaks in the incidence of respiratory diseases than did the other cities.

In the bottom section of figure 2 influenza and pneumonia death rates in the whole populations of these groups of cities have been plotted with death rates in the canvassed populations of the same cities. The numbers of deaths in the canvassed populations were small, and the rates show considerable chance variation. In the New England places, which covered only 25,000 persons, the deaths in the canvassed population were too few to give any indication of the chronology of the mortality. In the other two groups there is a rather close correspondence between the chronology of the mortality in the canvassed population and in the whole population of the same cities. The peaks come later in the death rates than in the case rates, since the deaths are classified according to the date of death and the cases according to the date of onset of the case.

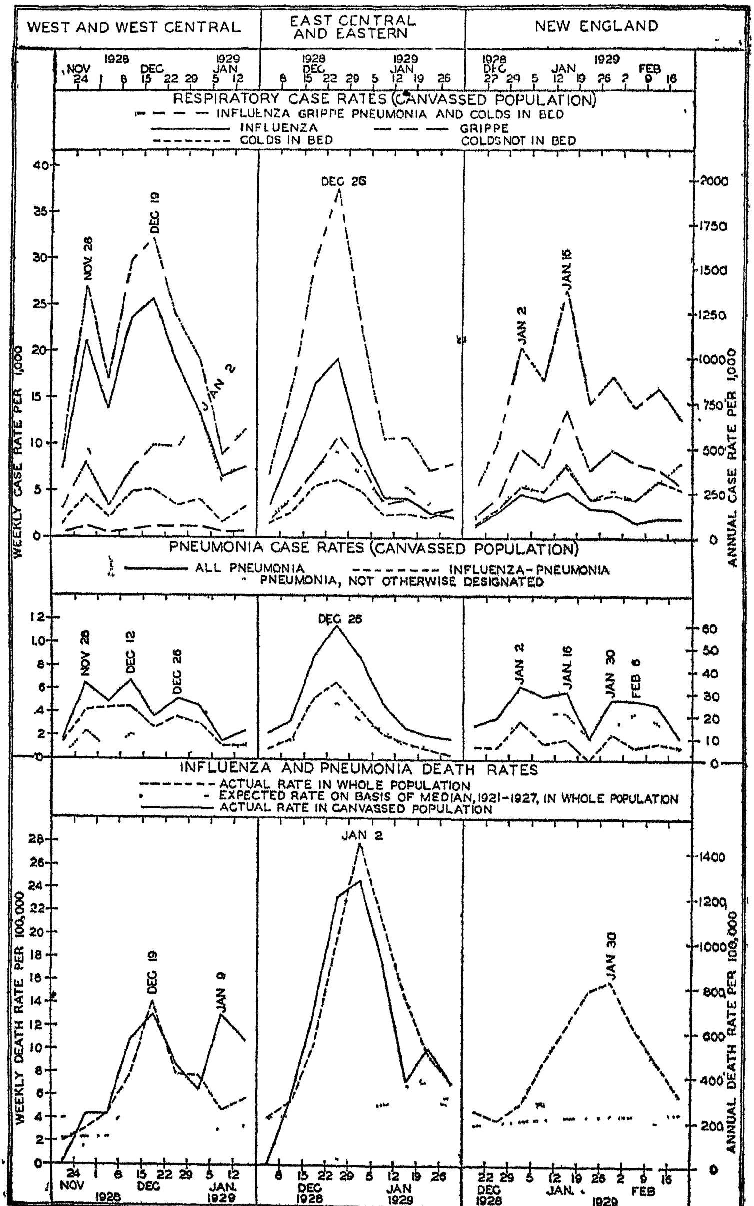

FIGURE 2.—Weekly incidence of various respiratory diagnoses and of mortality from influenza and pneumonia in 3 groups of surveyed localities during the epidemic of 1928–29.

REPRESENTATIVENESS OF THE CANVASSED POPULATION AND OF THE 10 CITIES AS A WHOLE

Of the many cities in the United States it was practicable to survey only 10. Only a small sample of the total population of a surveyed city was canvassed, but the sample was made up of families in various parts of the city. Two questions arise in regard to the representativeness of the samples. (*a*) Is the surveyed population in a given city representative of the total population of that city? and (*b*) Are these 10 cities representative of the general urban population of the United States? The only available data that afford any indications of the answers to these questions are the deaths from influenza and pneumonia in the surveyed and other cities in the United States.

Considering first the question whether the surveyed districts are representative of the city in which they are located, table 4 shows for each city the death rate per 100,000 in the surveyed and in the whole population. For the purpose of this table, deaths in both groups refer to those that occurred within the period for which sickness was recorded. This procedure was necessary because the only dates available for deaths in the whole city were the dates of death. The period for which sickness was recorded varied both in date and in length in the different cities.

TABLE 4.—*Mortality from influenza and pneumonia in the canvassed population and in the whole population of each of the 10 surveyed cities for the period [1] for which cases were recorded*

	All 10 cities	San Francisco	Seattle	Des Moines	Kansas City, Mo	New Orleans	Cincinnati	Pittsburgh	Baltimore	Syracuse	Boston
	Death rates per 100,000 population (actual basis)										
Influenza or pneumonia was sole or primary cause											
Canvassed population	85	7	26	104	59	54	43	260	103	56	57
Whole population	98	42	55	68	82	119	100	171	109	70	100
Ratio of canvassed to whole population rate (whole population rate=1 00)	87	16	47	2 41	.72	45	43	1 52	94	80	.57
Influenza or pneumonia was sole, primary, or contributory cause [2]											
Canvassed population	96	7	51	225	79	54	43	279	103	56	63
Whole population	126	78	71	87	105	129	126	197	141	88	142
Ratio of canvassed to whole population rate (whole population rate=1 00)	.76	09	72	2 50	75	42	34	1 42	73	64	44
	Number of deaths in canvassed population										
Influenza or pneumonia was sole or primary cause	113	1	3	16	6	8	5	41	17	6	10
Influenza or pneumonia was sole, primary, or contributory cause [2]	128	1	6	22	8	8	5	44	17	6	11

[1] Period varied from 9 to 14 weeks in the different cities, with an average of about 11 weeks

[2] Exclusive of pneumonia deaths secondary to the acute communicable diseases of childhood

Mortality data for whole population based on records copied from city health departments at time of survey.

It will be noted that with respect to deaths primarily[3] due to influenza or pneumonia, the death rate in the canvassed population of the 10 cities was 87 percent of the rate in the total population of these cities In 8 of the cities the rate was less in the canvassed group than in the total population, while in the other 2 cities it was greater In San Francisco the mortality in the canvassed population was only 16 percent of that in the city as a whole, and in Des Moines the death rate in the canvassed group was 241 percent of that in the whole city Considering not only deaths due primarily to influenza and pneumonia but all deaths in which influenza or pneumonia was a primary or a complicating cause (except pneumonia deaths that were secondary to the acute communicable diseases of childhood), the mortality in the canvassed population of the 10 cities was 76 percent of that in the total population. It should be noted in connection with these wide differences between the canvassed and total population that the numbers of deaths in the canvassed population of a given city were frequently very small and subject to rather wide chance fluctuation. Moreover, inmates of institutions of various kinds would not be included in the survey data, but would probably contribute unduly to the death rate in the city as a whole. Nonresident deaths would also increase the city rate, but not the rate in the surveyed group.

TABLE 5 —*Age specific death rates from influenza and pneumonia in the canvassed population and in the whole population of the 10 surveyed cities for the period*[1] *for which cases were recorded*

	All ages	Under 5	5-14	15-24	25-29	30-34	35-39	40-44	45-49	50-59	60-69	70 and over
	Death rates per 100,000 population (actual basis)											
Influenza or pneumonia was sole or primary cause.												
Canvassed population	85	145	13	18	28	55	81	50	62	131	245	813
Whole population	98	253	15	28	40	49	61	84	80	117	241	774
Ratio of canvassed to whole population rate (whole population rate=1 00)	.87	57	87	.64	70	1,12	1 33	.60	.78	1 12	1.02	1.05
Influenza or pneumonia was sole or primary or contributary cause[2]												
Canvassed population	96	155	13	26	28	73	90	50	62	139	302	925
Whole population	126	276	19	82	47	60	72	101	103	158	347	1,102
Ratio of canvassed to whole population rate (whole population rate=1.00)	.76	56	68	81	60	1 22	1 25	.50	.60	.88	.87	84
	Number of deaths in canvassed population											
Influenza or pneumonia was sole or primary cause	113	16	3	4	3	6	9	5	5	16	17	29
Influenza or pneumonia was sole, primary, or contributory cause[2]	128	17	3	6	3	8	10	5	5	17	21	33

[1] Average length of period about 11 weeks.
[2] Exclusive of pneumonia deaths secondary to the acute communicable diseases of childhood

Mortality data for whole population based on records copied from city health departments at time of survey.

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[3] In determining which of the causes was primary and which contributory, the rules set forth in the Manual of Joint Causes prepared by the Mortality Division, Bureau of the Census, were rigidly followed in order to make these data comparable with official mortality statistics.

One further comparison might be made of the mortality from influenza and pneumonia in the canvassed population with that in the whole population. Table 5 shows influenza and pneumonia death rates by age in the canvassed and in the whole population of all 10 cities combined. The age curves are compared graphically in figure 3. Although there is some difference between the rates in the two groups, it appears that the death rates due primarily to influenza or pneumonia are very similar There is somewhat more difference between the death rates in the two groups when both primary and secondary causes are taken into account, but insofar as mortality is used in this study it will refer chiefly to the deaths due primarily to influenza or pneumonia

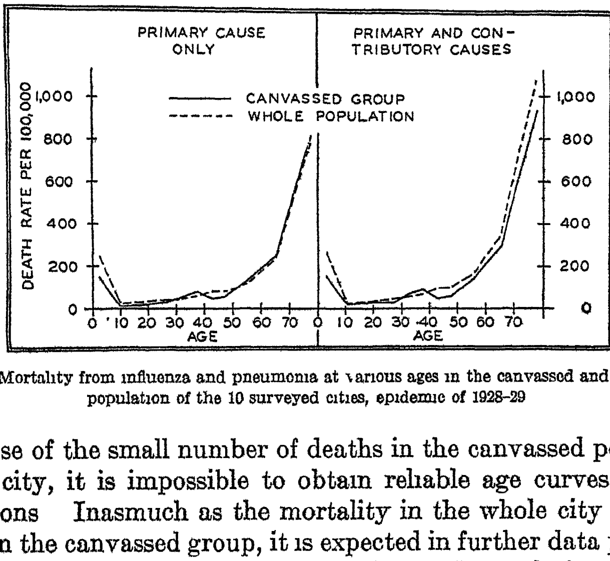

FIGURE 3.—Mortality from influenza and pneumonia at various ages in the canvassed and in the whole population of the 10 surveyed cities, epidemic of 1928–29

Because of the small number of deaths in the canvassed population of each city, it is impossible to obtain reliable age curves for such populations Inasmuch as the mortality in the whole city is similar to that in the canvassed group, it is expected in further data presented in this study to use the death rate in the total population as a substitute for the death rate in the canvassed portion of that population on the assumption that the death rate in the total population is fairly representative of what the real rate, apart from chance variation, would be in the canvassed groups.

As bearing on the second question of the representativeness of these 10 cities, table 6 shows death rates from influenza and pneumonia during the 12 weeks ending February 16, 1929, in the whole population of these 10 cities, in 95 cities (3) scattered throughout the United States and in 35 large cities (4). The table includes four measures of the extent of influenza and pneumonia mortality during this period: (*a*) The total influenza and pneumonia mortality during the 12 weeks, (*b*) the maximum weekly rate, (*c*) the total excess mortality from influenza and pneumonia during the 12 weeks, and (*d*) the maximum weekly

excess rate. All four of these measures indicate that the mortality of these 10 cities was considerably above that in the larger group of 95 cities, which itself was somewhat greater than in the 35 large cities. The best measure of the mortality attributable to the epidemic is the excess over what would normally be expected during these 12 weeks. The total excess in the 10 cities (58 1 per 100,000) was 31 percent greater than in the group of 95 cities (44.4 per 100,000). The relative disparity between the mortality in the 10 cities and that in the 95 cities is not so great when based on the total influenza and pneumonia death rate instead of the excess (21 percent), but the percentage difference between the maximum weekly rates (44 percent) and between the maximum weekly excess rates (64 percent) in the two groups of cities is even greater than that for the total excess rate The indications are, therefore, that the mortality in these 10 cities is considerably higher than the average mortality in the urban part of the United States. The 10 cities include Pittsburgh, which, except for Birmingham, had the highest excess mortality of any of the larger cities in the United States during the 1928-29 epidemic (4) The excess mortality in Des Moines, New Orleans, and Cincinnati was also considerably above the average for the larger cities of the country. Whether the sickness rates in these 10 cities are as much above the average for the urban portion of the United States as are the death rates cannot be determined as there are no sickness data for any large group of cities. It is probably true, however, that the percentage excess in the sickness rates in these 10 cities, as compared with larger groups of cities, is much less than the percentages quoted for mortality.

TABLE 6 — *Comparison of the death rate from influenza and pneumonia in the whole population of the 10 surveyed cities with that of two larger groups of cities in the United States during the 12 weeks from November 25, 1928, to February 16, 1929*

	Rates per 100,000			Ratio of 10-city rate to 95-city rate (95-city rate=1 00)	Ratio of 10-city rate to 35-city rate (35-city rate =1 00)
	10 surveyed cities	95 cities	35 large cities		
Total influenza and pneumonia death rate per 100,000 in the 12 weeks	108	89	86	1 21	1.26
Maximum weekly influenza and pneumonia death rate per 100,000	17 9	12 4	11 1	1.44	1 61
Total excess [1] influenza and pneumonia death rate per 100,000 in the 12 weeks	58 1	44 4	40 8	1 31	1 42
Maximum weekly excess [1] influenza and pneumonia death rate per 100,000	13 8	8 4	7 1	1 64	1.94
Maximum rate occurred in the week ending	Jan 5	Jan 12	Jan 12		

[1] Excess over an expected or normal rate based on the median rate for the same weeks during the 7-year period 1921-27

Data for all three groups of cities based on current weekly reports published in the Public Health Reports.

CASE INCIDENCE OF INFLUENZA, GRIPPE, AND COLDS

The surveys in the different communities recorded illnesses during the period that the sickness and death rates seemed to be distinctly above normal Reference to figure 1, showing the weekly incidence of influenzal conditions, will indicate that for the most part the surveys included only the weeks in which the sickness rates were distinctly high. However, there are normally so many cases of grippe and severe colds that it is hardly justifiable to compute case rates for periods of varying lengths in the different localities as representing the epidemic in that community unless there is some way to subtract from the total the expected incidence of influenza and grippe and obtain only the excess above the normal expectancy As there are no data whatever upon which to base an expected sickness rate in these cities, it seemed that the fairest way to compare the actual incidence of respiratory conditions in the different communities was to pick out equal length periods representing the time of highest incidence of respiratory cases.[4] An examination of figure 1 indicates that a period of 10 weeks usually covers the time when the incidence of respiratory conditions was distinctly high. Likewise, a period of 10 weeks covers the time when the mortality from influenza and pneumonia was distinctly above normal, although the period when the mortality was above normal usually ends one to three weeks later than the period of the high incidence of respiratory cases. Table 7 gives incidence rates during the highest 10 weeks in each locality, the date of the 10-week period varying with the different communities in accordance with the indications afforded in figure 1. The first column in the table shows for this 10-week period the incidence of cases reported as influenza, grippe, pneumonia, and colds that caused the patient to go to bed.[5] The second column gives the incidence of influenza, grippe, and pneumonia, exclusive of all cases that were designated as colds.

[4] Even this method leaves a seasonal factor in that part of the rate that represents the normal incidence and therefore overstates the extent of the epidemic in communities in which it occurred in January and February as compared with communities in which it occurred in November and December

[5] For the 14 localities as a whole, 87 percent of the cases reported as influenza and 85 percent of the cases reported as grippe caused the patient to go to bed for one day or longer Because of the varying terminology, it seemed that the comparison between the different communities would be more valid if the severe colds causing the patient to go to bed (35 percent of the cases reported as colds) were included with the other influenzal conditions Of the cases reported as influenza, 96 percent were disabling (caused loss of time from the patient's usual occupation), as compared with 97 percent for grippe and 66 percent for all colds. Of the influenzas, 59 percent were attended by a doctor as compared with 65 percent for grippe, 39 percent for colds in bed, 11 percent for colds not in bed, and 21 percent for all colds.

TABLE 7.—*Incidence of respiratory conditions among canvassed families for the 10 consecutive weeks*[1] *with the highest respiratory case rates during the epidemic of 1928–29*

Locality	Case rates[2] per 1,000 persons canvassed						Number of persons canvassed	Date of beginning and end of 10-week period
	Influenza, grippe, pneumonia, and colds in bed	Influenza, grippe, and pneumonia	Influenza	Grippe	Colds in bed	Colds not in bed		
San Francisco	110	93	90.0	0.9	17.4	38.7	14,981	Oct 14–Dec 22, 1928
Seattle	211	171	159.0	8.8	40.4	72.5	11,704	Nov. 18–Jan 26, 1929
Des Moines	298	265	246.1	12.4	33.1	122.4	9,771	Nov 25–Feb 2, 1929.
Kansas City, Mo	190	150	127.0	16.5	39.0	69.4	10,146	Nov 18–Jan 26, 1929
Farmington, Mo	221	151	147.9	8	70.3	111.1	1,224	Dec 2–Feb 9, 1929
New Orleans	159	139	107.4	28.8	19.5	59.1	14,898	Nov 25–Feb 2, 1929
Cincinnati	161	125	70.0	50.8	36.5	82.5	11,565	Dec 2–Feb 9, 1929
Pittsburgh	179	136	84.9	43.3	13.5	62.9	15,785	Do
Baltimore	130	108	21.5	78.8	22.1	10.9	16,445	Dec 9–Feb. 16, 1929.
Syracuse	173	124	87.1	33.2	48.8	75.7	10,692	Dec 2–Feb 9, 1929.
Cattaraugus County	311	265	147.2	109.9	46.3	57.2	4,041	Dec 23–Mar 2, 1929
Minor New York towns	282	252	201.6	44.8	30.2	47.0	2,322	Dec 16–Feb 23, 1929.
Boston	148	96	26.2	65.0	52.0	56.1	17,477	Do
Minor Massachusetts towns	174	134	34.0	96.3	40.2	49.3	10,139	Dec 23–Mar 2, 1929.
Great Barrington	212	156	62.4	88.5	56.1	74.6	2,532	Do
Palmer	180	140	22.4	115.2	39.2	43.9	2,551	Do
Saugus	157	126	19.3	102.1	30.8	39.0	2,536	Dec 30–Mar 9, 1929
Nantucket	149	114	29.4	83.3	34.5	44.1	2,520	Dec 23–Mar 2, 1929
All 10 cities[3]	169	135	95.1	35.7	34.4	61.1	133,467	
All localities[3]	175	141	94.1	42.0	35.4	60.3	151,193	

[1] Cases with unknown date of onset are excluded, but very few cases were of unknown onset except for colds *not* in bed

[2] Rates in this table are summations of 10 weekly rates; at the beginning and end of the survey, four or more days of a calendar week were used as a week, the data being raised to a full 7 day basis In several places the total period covered was about 10 weeks and the sum of the 10 weekly rates is about the same or fractionally greater than the whole period rate shown elsewhere In the case of Cincinnati and Pittsburgh, only 9 weeks' data were collected, and the last week, ending Feb 2, was counted twice to put these two cities on a 10 week basis

[3] Weighted average of the rates for the localities included, the weights being proportional to the numbers of persons canvassed

Considering only the 10 large cities with about 10,000 to 15,000 surveyed population, the case rate for the total influenza, grippe, pneumonia, and colds in bed for the 10 highest weeks varied from 110 per 1,000 persons canvassed in San Francisco, where there was little evidence of any sharp epidemic, to 298 per 1,000 in Des Moines, Iowa. The cases designated as influenza, grippe, or pneumonia varied from 93 per 1,000 in San Francisco to 265 per 1,000 in Des Moines. Although the highest and the lowest cities remain the same in these two categories, there is considerable difference in the order of the other cities; in other words, colds in bed also varied considerably in the different cities.

In general, the small towns and rural communities had higher case rates than the cities. The number of persons surveyed in these places was not large, and, of perhaps more importance, the surveyed rural places are not in the same sections of the country as the surveyed cities. For these reasons a comparison of the urban and rural rates does not seem justifiable. It might be noted, however, that the rate in Boston is somewhat below the rate in a group of

four minor towns in Massachusetts. This is true of the various categories in which the diseases are tabulated, except that the pneumonia rate and also the total death rate from influenza and pneumonia was higher in Boston than in the minor towns.

Considering the 10 cities combined, many more conditions were reported as influenza than as grippe This might have been expected, since the instructions of the enumerators were to record a case as grippe only if the informant stated that she did not mean the same as influenza In spite of these instructions, a large proportion of the cases are reported as grippe in several of the eastern cities, whereas in the West and Middle West very few cases are so designated In San Francisco the grippe rate was less than 1 per 1,000, as against 90 per 1,000 for influenza, but in Baltimore the grippe rate was 79 per 1,000 as against 24 per 1,000 for influenza In Boston the rate was 65 for grippe and 26 for influenza, and in each of the four minor towns of Massachusetts more cases were reported as grippe than as influenza In all localities except Baltimore, Boston, and these Massachusetts towns, more cases were reported as influenza than as grippe. In a former article (1) data presented on the age curves of cases reported as grippe and as influenza indicated that with respect to age incidence the two diagnoses were identical It will be remembered in connection with figure 2 that, with respect to chronology, influenza and grippe were also identical. It appears that so far as epidemiological evidence is concerned, cases designated as grippe were identical with those designated as influenza, and in the remainder of this study the two diagnoses will be considered as a unit.

Rates are also shown in table 7 for colds that caused the patient to go to bed and the minor colds that did not cause the patient to go to bed. In spite of the fact that the latter are more numerous than the colds in bed, a comparison with other studies of respiratory diseases (5) indicates that by no means all of the minor colds could be included in this figure—in fact, a single canvass in which illness was recorded for a period of 10 or more weeks would obviously miss a large proportion of the mild colds because the informant would have forgotten them. The weekly rates as shown in figure 2 indicate that, although there is a peak in the colds that did not cause the patient to go to bed which corresponds to the influenza peak, the rate in general is much higher in the last few weeks of the study period than in the earlier weeks This suggests that a larger proportion of the recent colds were remembered and reported than was true of those occurring earlier. Quite a large part of the colds not in bed that were reported as occurring within the period of the survey were unknown as to the exact week of onset and are automatically excluded from the weekly tabulation and from the tabulation covering the 10 highest weeks. In the

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instances of influenza, grippe, pneumonia, and even of colds in bed, the numbers of cases of unknown week of onset were negligible. Even if the colds not in bed with unknown date of onset be included, the incidence for the period of approximately 10 weeks would still be far below the expected incidence as indicated by reports (5) secured at more frequent intervals Because of the incompleteness of colds not in bed, they are omitted from any further consideration in this study, which, by reason of the method of collecting the data, pertains primarily to the conditions of sufficient severity to have been remembered by the housewife for a period of one or two months.

Before proceeding to the consideration of the age curves in the different localities, it might be well to review the nature of the age

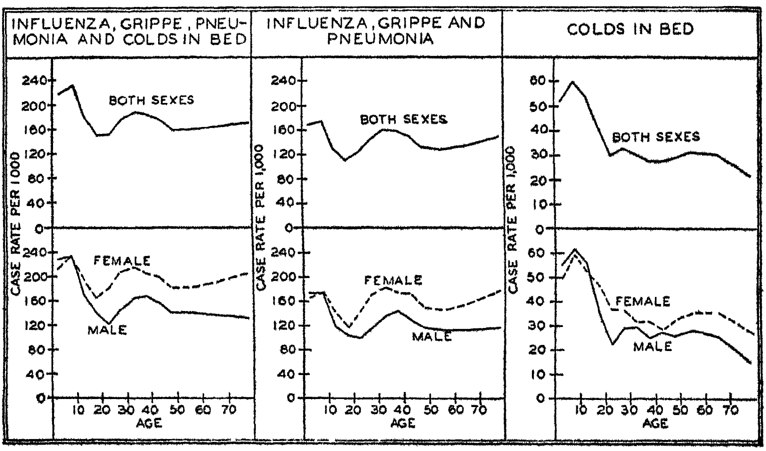

FIGURE 4.—Age and sex incidence of certain respiratory conditions in the 10 surveyed cities during the epidemic of 1928-29.

curve in the 10 cities as a whole. Table 8 and figure 4 show by age and sex the incidence of the total cases of influenza, grippe, pneumonia, and colds in bed; of influenza, grippe, and pneumonia only; and of colds in bed. Although the age curve of colds in bed is quite different from that of the cases designated as influenza and grippe, colds in bed do not represent a large proportion of the total and do not materially change the total curve from that of influenza, grippe, and pneumonia only.

TABLE 8.—*Age and sex incidence of certain respiratory conditions in the canvassed families in the 10 surveyed cities during the epidemic of 1928–29*

Age	Case rate per 1,000 persons canvassed									Number of persons canvassed		
	Influenza, grippe, pneumonia, and colds in bed			Influenza, grippe, and pneumonia			Colds in bed					
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages [1]	181	163	197	143	128	157	37.7	35.5	39.8	133,467	63,594	69,867
Under 5	222	229	215	169	173	165	52.3	55.1	49.5	11,001	5,540	5,459
5 to 9	234	234	234	174	173	175	60.5	61.7	59.4	12,044	5,978	6,066
10 to 14	184	172	195	129	117	142	54.5	55.6	53.5	11,391	5,651	5,740
15 to 19	152	139	164	111	104	117	41.1	34.7	46.9	11,195	5,307	5,888
20 to 24	154	121	181	124	98	144	30.6	22.6	37.0	11,489	5,134	6,355
25 to 29	179	145	207	146	116	170	33.4	29.3	36.7	10,735	4,841	5,894
30 to 34	191	164	215	161	135	183	30.7	29.5	31.8	10,932	5,083	5,848
35 to 39	187	168	206	159	143	174	28.4	25.0	31.7	11,110	5,393	5,717
40 to 44	178	157	199	150	130	170	28.3	27.6	28.9	9,981	4,998	4,983
45 to 49	162	142	182	133	116	149	29.5	26.0	32.7	8,076	3,883	4,192
50 to 59	161	141	181	129	112	145	32.0	28.2	37.5	12,238	5,948	6,290
60 to 69	166	137	190	135	112	154	31.1	25.7	35.7	6,952	3,197	3,755
70 and over	173	131	204	151	116	176	22.7	15.3	28.1	3,568	1,502	2,064

[1] All ages includes some of unknown age

Table 9 and figure 5 show age curves for each surveyed locality. Because of the variation in the actual rates in the different communities, the data have been put on a ratio basis, being expressed as the ratio of the rate at each age to the rate for all ages. There is considerable variation from city to city in the nature of the age curve, but there are certain characteristics that persist in all of the cities. In general, the incidence is slightly less for children under 5 than it is for those from 5 to 9 years of age. In some of the cities the rate is as high under 5 years as it is from 5 to 9 years, or higher, but in all cities the rate in the whole group under 10 is higher than at later ages. After 10 years there is a rather sharp decrease to a minimum at about 15–24 years, with a second rise to a maximum at about 30–39 years, followed by another decline. The second peak at 30-39 years shows up fairly definitely in every city and town and seems to be the most characteristic part of the influenza age curve. In this respect the curve is considerably different from that of cases designated merely as colds. Considering the 10 cities as a whole, as shown in figure 4, there is a rise in the respiratory rate in the older ages, particularly among women; but the old age rise does not show up in every city in the curve for both sexes.

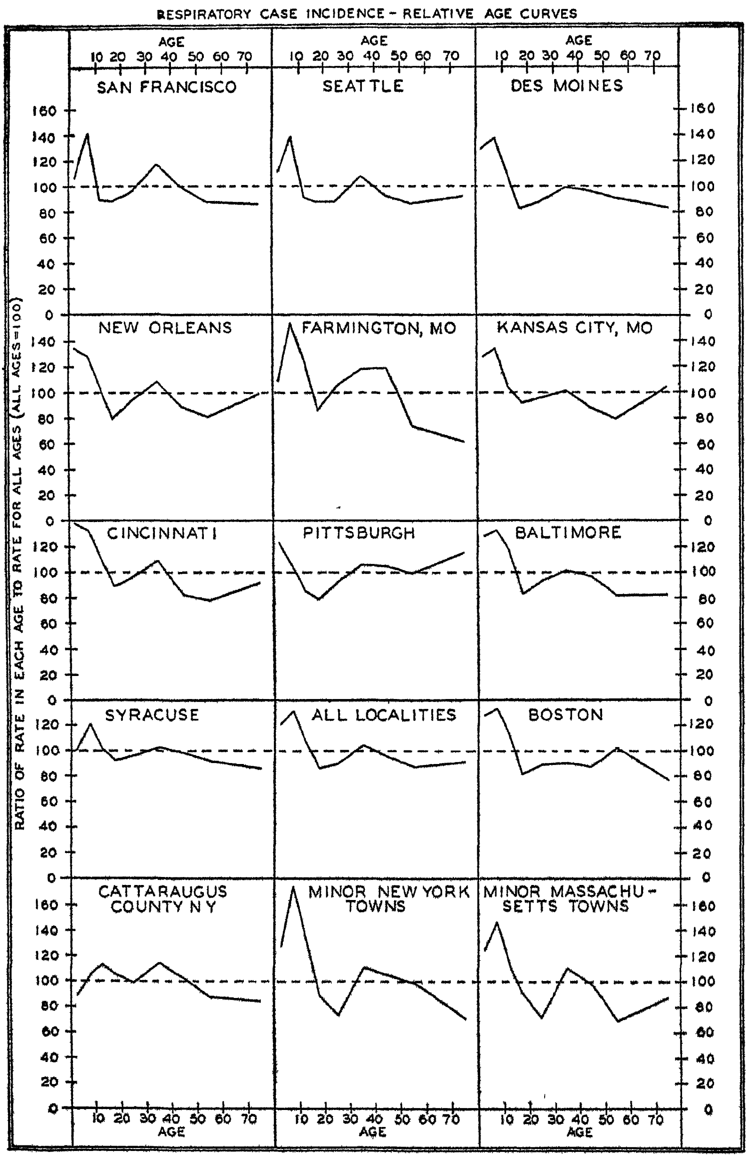

FIGURE 5.—Relative age incidence of respiratory cases in each surveyed locality during the epidemic of 1928–29. Respiratory cases include influenza, grippe, pneumonia, and colds in bed.

TABLE 9.—*Age and sex incidence of respiratory diseases during the epidemic of 1928–29 in canvassed families in certain localities in the United States*

[Case rates per 1,000 persons canvassed]

Age	Influenza, grippe, pneumonia, and colds in bed			Both sexes			Influenza, grippe, pneumonia, and colds in bed			Both sexes		
	Both sexes	Male	Female	Influenza, grippe, and pneumonia	Colds in bed	Number of persons canvassed	Both sexes	Male	Female	Influenza, grippe, and pneumonia	Colds in bed	Number of persons canvassed
	All surveyed localities						All 10 cities					
All ages	189	172	205	149	39.6	151,193	181	163	197	143	37.7	133,467
Under 5	229	237	221	175	53.7	12,565	222	229	215	169	52.3	11,001
5 to 9	248	245	252	184	64.1	13,798	234	234	234	174	60.5	12,044
10 to 14	200	186	213	140	59.7	13,107	184	172	195	129	54.5	11,391
15 to 19	163	151	175	119	43.8	12,780	152	139	164	111	41.1	11,195
20 to 29	170	139	195	137	33.0	24,508	166	133	193	134	31.9	22,224
30 to 39	198	174	220	167	30.5	24,491	189	166	211	160	29.6	22,042
40 to 49	180	158	201	149	30.6	20,193	171	150	191	142	28.8	18,057
50 to 59	167	148	184	135	32.1	14,020	161	141	181	129	31.9	12,238
60 and over	174	146	197	145	29.3	12,784	168	135	195	140	28.2	10,520
	San Francisco						Seattle					
All ages	161	150	171	126	34.5	14,081	222	200	242	179	42.5	11,704
Under 5	173	195	154	131	41.7	1,102	248	255	241	192	56.0	911
5 to 9	229	230	229	155	73.9	1,178	308	335	281	229	78.5	1,134
10 to 14	145	122	167	101	44.2	1,041	204	178	229	136	67.8	1,062
15 to 19	144	125	160	99	45.1	1,132	195	151	236	148	46.7	963
20 to 29	154	123	179	128	25.6	2,498	196	162	221	163	33.3	1,620
30 to 39	189	175	202	160	29.0	2,549	239	212	261	208	31.2	2,022
40 to 49	159	155	163	134	25.5	2,118	206	189	223	174	32.2	1,866
50 to 59	141	136	146	112	28.5	1,403	193	160	227	159	33.7	1,128
60 and over	140	112	165	108	31.7	1,169	207	154	258	182	24.9	965
	Des Moines						Kansas City, Mo					
All ages	304	289	318	271	32.5	9,774	188	176	199	149	39.5	10,146
Under 5	394	367	421	351	43.5	804	241	247	234	180	60.6	742
5 to 9	418	412	423	363	55.4	830	254	243	265	189	65.4	764
10 to 14	325	314	335	277	48.4	806	195	185	204	135	60.1	766
15 to 19	251	244	255	209	42.1	784	174	166	181	124	50.4	754
20 to 29	266	232	291	234	32.2	1,555	180	151	202	148	32.3	1,609
30 to 39	305	289	321	283	21.8	1,606	191	190	192	158	33.3	1,923
40 to 49	295	284	306	273	21.9	1,415	165	153	178	136	29.3	1,469
50 to 59	278	292	264	247	30.9	1,002	150	131	169	117	32.7	1,009
60 and over	255	221	285	236	18.5	972	198	173	219	169	28.7	870
	Farmington, Mo						New Orleans					
All ages	230	202	255	158	71.9	1,224	181	162	196	157	24.0	14,898
Under 5	250	245	256	187	62.5	96	242	257	227	211	30.7	1,336
5 to 9	355	302	426	228	127.3	110	231	243	220	193	38.2	1,389
10 to 14	283	230	346	168	115.0	113	188	176	201	154	33.6	1,222
15 to 19	198	208	191	132	66.1	121	143	128	155	118	25.5	1,253
20 to 29	242	258	233	175	66.7	165	169	132	195	150	18.8	2,879
30 to 39	271	226	308	192	78.6	140	196	164	223	175	21.0	2,335
40 to 49	273	190	343	203	70.3	128	159	131	185	141	18.1	1,769
50 to 59	169	143	195	111	58.4	154	147	101	188	136	10.5	1,051
60 and over	141	91	175	98	42.9	163	179	165	191	156	23.2	775

Table 9—*Age and sex incidence of respiratory diseases during the epidemic of 1928–29 in canvassed families in certain localities in the United States*—Con.

Age	Influenza, grippe, pneumonia, and colds in bed			Both sexes			Influenza, grippe, pneumonia, and colds in bed			Both sexes		
	Both sexes	Male	Female	Influenza, grippe, and pneumonia	Colds in bed	Number of persons canvassed	Both sexes	Male	Female	Influenza, grippe, and pneumonia	Colds in bed	Number of persons canvassed
	Cincinnati						Pittsburgh					
All ages	159	138	179	124	35.1	11,565	181	158	202	139	42.3	15,785
Under 5	218	219	218	167	51.3	839	220	233	204	159	61.3	1,289
5 to 9	210	208	212	164	46.4	927	192	191	192	139	52.8	1,440
10 to 14	176	167	186	121	55.2	979	153	155	151	101	51.9	1,485
15 to 19	141	127	153	98	42.7	960	143	123	161	102	41.3	1,404
20 to 29	153	127	173	119	34.2	1,841	167	132	196	131	36.3	2,756
30 to 39	173	131	210	146	27.2	1,986	190	162	217	156	34.2	2,602
40 to 49	130	112	148	107	22.7	1,589	188	148	229	151	36.6	2,051
50 to 59	124	86	158	99	25.3	1,185	180	150	209	133	47.1	1,487
60 and over	146	119	165	113	33.5	1,193	209	151	253	177	32.1	1,183
	Baltimore						Syracuse					
All ages	138	118	157	113	24.6	16,445	177	164	190	126	50.8	10,692
Under 5	177	174	180	136	41.3	1,306	179	194	164	112	67.3	891
5 to 9	184	175	192	152	31.9	1,475	214	223	206	135	78.6	1,031
10 to 14	162	145	177	126	36.0	1,332	181	170	193	117	64.3	948
15 to 19	115	100	129	94	21.5	1,398	165	164	166	108	56.8	862
20 to 29	129	90	164	108	20.9	2,818	172	149	193	128	43.7	1,762
30 to 39	139	112	162	120	19.0	2,470	183	160	207	141	42.1	1,899
40 to 49	134	120	146	110	23.8	2,186	173	144	203	136	37.5	1,439
50 to 59	113	100	123	99	14.1	1,561	163	155	170	118	44.5	989
60 and over	115	77	144	94	20.9	1,434	152	131	169	111	40.9	831
	Cattaraugus Co.						Minor New York towns					
All ages	348	325	372	294	54.4	4,041	290	286	294	253	37.0	2,322
Under 5	306	326	284	254	52.3	363	368	388	347	335	32.9	152
5 to 9	362	335	389	275	87.1	450	506	484	533	446	60.2	166
10 to 14	389	308	464	276	113.3	512	378	349	404	308	70.3	185
15 to 19	362	314	413	295	67.0	373	254	262	246	203	50.7	217
20 to 29	341	328	357	291	50.3	457	212	201	225	177	35.3	312
30 to 39	394	361	422	367	27.1	553	320	359	280	297	23.4	256
40 to 49	353	358	347	323	29.9	502	302	248	340	273	29.1	275
50 to 59	303	309	297	265	37.9	396	285	276	293	242	43.3	277
60 and over	290	275	309	266	24.4	410	203	199	207	182	20.7	482
	Boston						Minor Massachusetts towns					
All ages	154	138	169	99	54.5	17,477	208	195	219	155	52.9	10,139
Under 5	197	204	189	126	70.7	1,781	257	272	242	189	68.2	953
5 to 9	205	198	212	118	86.9	1,876	303	271	335	220	83.4	1,019
10 to 14	173	170	175	94	79.4	1,750	236	242	230	155	81.3	996
15 to 19	126	130	122	74	51.6	1,685	188	175	198	129	59.5	874
20 to 29	137	108	167	89	48.2	2,886	148	136	160	109	38.5	1,350
30 to 39	140	118	160	103	37.4	2,650	228	195	257	186	42.0	1,500
40 to 49	136	107	163	97	39.4	2,155	201	165	232	151	50.4	1,231
50 to 59	158	119	195	107	51.2	1,425	144	143	144	121	23.0	955
60 and over	122	93	144	93	29.3	1,128	180	171	186	138	42.2	1,209

TABLE 9.—*Age and sex incidence of respiratory diseases during the epidemic of 1928–29 in canvassed families in certain localities in the United States*—Con.

Age	Influenza, grippe, pneumonia, and colds in bed			Both sexes			Influenza, grippe, pneumonia, and colds in bed			Both sexes		
	Both sexes	Male	Female	Influenza, grippe, and pneumonia	Colds in bed	Number of persons canvassed	Both sexes	Male	Female	Influenza, grippe, and pneumonia	Colds in bed	Number of persons canvassed
	Great Barrington, Mass.						Palmer, Mass.					
All ages	220	213	226	161	58.5	2,532	211	202	220	161	49.8	2,551
Under 5	289	290	280	196	92.8	194	279	287	270	206	73.0	233
5 to 9	321	266	376	233	88.4	249	324	327	321	236	88.0	284
10 to 14	231	217	248	144	86.8	242	192	231	155	145	47.1	276
15 to 19	165	174	159	108	56.5	230	236	227	243	168	68.0	250
20 to 29	179	187	173	118	60.8	296	145	133	157	118	26.9	372
30 to 39	238	214	260	207	31.4	382	235	174	285	198	36.7	354
40 to 49	233	199	263	181	52.3	287	215	184	244	142	72.8	316
50 to 59	156	152	159	125	31.1	257	101	112	91	83	18.4	217
60 and over	199	227	181	146	52.5	362	175	152	194	155	20.3	246
	Saugus, Mass.						Nantucket, Mass.					
All ages [1]	215	198	232	164	51.3	2,536	184	166	200	132	52.0	2,520
Under 5	277	295	255	245	32.1	249	199	214	185	120	79.4	277
5 to 9	325	258	400	242	83.3	252	235	214	252	162	72.6	234
10 to 14	313	302	326	211	101.9	265	202	210	194	108	93.9	213
15 to 19	198	171	223	129	69.0	232	130	107	149	93	37.0	162
20 to 29	118	105	131	91	27.3	330	153	129	178	110	42.6	352
30 to 39	230	217	242	179	50.6	395	209	172	243	160	48.8	369
40 to 49	170	135	201	131	39.4	330	188	147	222	151	36.9	298
50 to 59	134	153	114	125	8.6	232	177	150	199	145	32.1	249
60 and over	188	146	222	135	53.1	245	157	154	160	118	39.3	356

[1] All ages includes some of unknown age.

SEX

Figure 4 and table 8 show incidence rates by sex for the different categories of respiratory disease. It will be noted that, with the exception of the younger age groups, the rates for females are uniformly higher than those for males. The informant in the household was usually a woman and the record consists of respiratory conditions usually of a rather mild character that were remembered over a period of 2 to 3 months. Because of these facts the sex differences should be discounted somewhat as the informant would probably remember her own minor illnesses better than those of other members of the family.

Table 10 shows for each surveyed locality the case rates for males and females of all ages and the ratio of the rate for females to that for males. Considering the 10 surveyed cities, the differences in this sex ratio vary from 1.33 in Baltimore to 1.10 in Des Moines, Iowa. In other words, in Baltimore the female rate for influenza, grippe, pneumonia, and colds in bed is 33 percent higher than the rate for males, and in Des Moines the female rate is 10 percent higher than

the male rate, the other localities falling between these limits. If colds in bed are excluded from the total and we consider only influenza, grippe, and pneumonia, the result is not greatly different, the range in the ratios being from 1 35 in Cincinnati to 1 09 in Des Moines.

TABLE 10 —*Incidence of respiratory conditions among males and females in canvassed families during whole period*[1] *covered by the survey, epidemic of 1928-29*

Locality	Influenza, grippe, pneumonia, and colds in bed			Influenza, grippe, and pneumonia			Colds in bed			No of persons canvassed		Number of weeks[1] covered by the sickness records
	Case rate per 1,000		Ratio of female to male rate (male rate=1 00)	Case rate per 1,000		Ratio of female to male rate (male rate=1 00)	Case rate per 1,000		Ratio of female to male rate (male rate=1 00)			
	Male	Female		Male	Female		Male	Female		Male	Female	
San Francisco	150	171	1 14	117	136	1 16	33 8	35 1	1 04	7,150	7,827	14.0
Seattle	200	242	1.21	160	197	1 23	39 9	44 9	1 13	5,619	6,085	10.7
Des Moines	289	318	1 10	259	283	1 09	30 3	34 6	1 14	4,624	5,149	11.0
Kansas City, Mo	176	199	1 13	138	158	1 15	38 2	40 7	1 07	4,919	5,227	9 9
Farmington, Mo	202	255	1 26	141	174	1 23	61 5	80 9	1 32	569	655	10 3
New Orleans	162	196	1 21	138	172	1 25	24 0	24 0	1 00	6,866	8,031	13 9
Cincinnati	138	179	1 30	105	142	1 35	33 1	36 9	1 11	5,385	6,180	9 3
Pittsburgh	158	202	1 28	120	157	1.31	38 6	45.6	1.18	7,612	8,173	9.3
Baltimore	118	157	1 33	98	128	1 31	20 1	28 5	1 42	7,695	8,750	11.6
Syracuse	164	190	1 16	113	139	1 23	50 4	51 2	1.02	5,278	5,414	10 3
Cattaraugus County	325	372	1 14	280	308	1.10	45 0	64 1	1.42	2,044	1,997	13.0
Minor New York towns	286	294	1 03	255	250	.98	30 4	43 3	1 42	1,120	1,202	12.6
Boston	138	169	1 22	88	110	1 25	49 3	59 4	1.20	8,446	9,031	10.4
Minor Massachusetts towns	195	219	1 12	141	168	1 19	53 9	51 9	96	4,820	5,319	12 9
Great Barrington	213	226	1 06	150	171	1 14	62 2	55 3	89	1,157	1,375	11 3
Palmer	202	220	1 09	150	173	1 15	52 1	47.6	91	1,228	1,323	12.3
Sauguss	198	232	1 17	150	178	1 19	48 2	54 2	1 12	1,245	1,291	14 6
Nantucket	166	200	1 20	111	149	1 34	53 8	50 4	94	1,190	1,330	13 4
All 10 cities	163	197	1 21	128	157	1 23	35 5	39 8	1 12	63,594	69,867	11 1
All localities	172	205	1 19	135	163	1 21	37.3	41 8	1 12	72,147	79,040	11 3

[1] In each city the period for which sickness records were made included the weeks during which respiratory conditions appeared to be definitely above normal in that particular locality.

COLOR

In 6 of the surveyed localities the canvassed population included more than 500 colored people, and in 4 of the 6 the number of colored persons surveyed was above 1,000. Table 11 shows case rates for white and colored and the ratio of the colored to the white rate. Considering all 6 places together, the rate among colored for the total of influenza, grippe, pneumonia, and colds in bed was only 59 percent of the rate among whites. Considering only influenza, grippe, and pneumonia, the ratio was slightly higher, 64 percent. In every one of the six cities the rates as reported by the colored families were less than those reported by the white. It is probable, however, that some of the difference is due to less complete reporting

of respiratory attacks by the colored families The canvassers were white, and with no experience in obtaining information from colored people they might have failed to get as complete a record of minor illnesses among the colored as among the white families. This assumption is somewhat strengthened by the fact, as will be seen in later sections, that the difference in white and colored rates is much less for pneumonia incidence and for influenza and pneumonia mortality than is true of the minor respiratory cases On the other hand, it may be that minor respiratory cases actually occurred less frequently among the colored, but their severity as indicated by pneumonia complications and case fatality was greater

TABLE 11 —*Incidence of respiratory conditions among white and colored canvassed families during the whole period*[1] *covered by the survey, epidemic of 1928–29*

City	Influenza, grippe, pneumonia, and colds in bed			Influenza, grippe, and pneumonia			Colds in bed			Number of persons canvassed		Number of weeks[1] covered by the sickness records
	Case rate per 1,000		Ratio of colored to white rate (white rate=1 00)	Case rate per 1,000		Ratio of colored to white rate (white rate=1 00)	Case rate per 1,000		Ratio of colored to white rate (white rate=1 00)	White	Colored	
	White	Colored		White	Colored		White	Colored				
All 6 cities	174	103	0. 59	134	86	0 64	39 9	16 6	0 42	75,403	10,913	10 9
New Orleans	205	123	. 60	177	108	61	28 0	14. 5	52	10,496	4,402	13. 9
Baltimore	155	64	. 41	127	55	43	28 0	9 3	. 33	13,440	3,005	11 6
Boston	157	103	. 65	101	72	71	56 1	30 7	55	16,370	1 107	10 4
Pittsburgh	188	90	. 48	144	75	. 52	44 3	14 8	33	14,705	1,080	9 4
Kansas City, Mo	191	156	81	151	122	81	40 0	33 6	84	9,342	804	9 9
Cincinnati	162	107	. 66	126	84	66	35 7	23 3	65	11,050	515	9. 3

[1] In each city the period for which sickness records were made included the weeks during which respiratory conditions appeared to be definitely above normal in that particular locality

THE FREQUENCY OF PNEUMONIA AS A COMPLICATION

Pneumonia occurred rather infrequently during the epidemic of 1928–29. However, its importance is so great that it cannot be overlooked. It can perhaps be assumed that the number of cases of pneumonia is rather complete, since the informant would hardly forget a case that occurred within the preceding 3 months. There were occasional reports of deaths from influenza in which pneumonia was not mentioned, but in the tabulations such severe cases have been considered as pneumonia. The best medical opinion seems to be that pneumonia probably intervenes in all influenza cases before death occurs.

TABLE 12.—*Incidence of pneumonia among canvassed families for the 10 consecutive weeks [1] with the highest respiratory case rates during the epidemic of 1928–29*

Locality	Pneumonia case rate [1] per 1,000	Percent of respiratory cases [2] complicated by pneumonia	Locality	Pneumonia case rate [1] per 1,000	Percent of respiratory cases [2] complicated by pneumonia
San Francisco	1.80	1.64	Cattaraugus County	7.91	2.51
Seattle	3.18	1.50	Minor New York towns	5.16	1.83
Des Moines	6.46	2.17	Boston	4.74	3.20
Kansas City, Mo.	6.02	3.35	Minor Massachusetts towns	3.44	1.98
Farmington, Mo	2.46	1.11	Great Barrington	5.12	2.41
New Orleans	3.15	1.98	Palmer	2.73	1.52
Cincinnati	3.91	2.42	Saugus	4.72	3.01
Pittsburgh	7.80	3.23	Nantucket	1.59	1.07
Baltimore	4.55	3.30	All ten cities [3]	4.31	2.55
Syracuse	4.20	2.42	All localities [3]	4.56	2.60

[1] Rates in this table are summations of 10 weekly rates (See notes to table 7 for details of computation.)
[2] Respiratory cases referred to include influenza, grippe, pneumonia, and colds in bed
[3] Weighted average of the rates for the highest 10 weeks for each locality included, the weights being proportional to the numbers of persons canvassed

As in the instance of influenza and grippe cases, there are no data for preceding years that can serve as any indication of the normal or expected pneumonia incidence in these cities In the absence of such

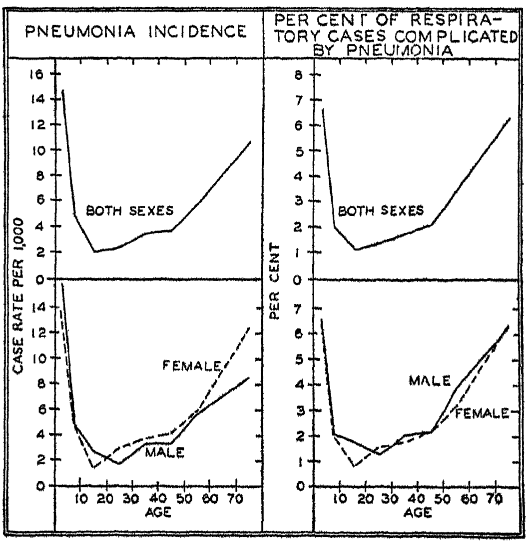

FIGURE 6.—Age and sex incidence of pneumonia in the 10 surveyed cities during the epidemic of 1928-29.

a normal that would enable us to compute an excess rate, the best available index of the extent of pneumonia during the epidemic appears to be the case rate during a period of the same length in each locality. Table 12, which shows the pneumonia rates and the proportion of respiratory cases complicated by pneumonia, is confined

to a 10-week period in each locality, the same as that indicated in table 7 as having the highest respiratory case rates Considering the 10 cities as a whole the average of the pneumonia case rates for the highest 10 weeks in each city was 4.3 per 1,000 persons canvassed. In the different cities the rate varied from 7.8 in Pittsburgh to 1 8 per 1,000 in San Francisco For the 10 cities as a whole, 2 6 percent of the respiratory cases with their onset in the 10 epidemic weeks were complicated by pneumonia; in other words, the pneumonia cases constituted 2.6 percent of the respiratory cases This percentage varied in the 10 cities from 1.5 in Seattle to 3 5 in Baltimore.

AGE

Because of the peculiarly high incidence of pneumonia at young adult ages during the great pandemic of 1918–19, it is always a matter of considerable interest to determine the age curve of pneumonia in the smaller epidemics that have occurred since that time Table 13 and figure 6 show for the 10 cities combined the incidence of pneumonia per 1,000 canvassed population at different ages and also the percentage of respiratory cases that were complicated by pneumonia. It will be noted that there is, unlike the 1918–19 epidemic, no indication of any young adult peak in the incidence of pneumonia during this epidemic. This comparison with the 1918–19 epidemic has already been considered in some detail in a preceding paper (1).

TABLE 13.—*Pneumonia incidence and mortality from influenza and pneumonia at different ages for each sex in the 10 surveyed cities during the whole period covered by the survey, epidemic of 1928–29*

Age	Pneumonia case rate per 1,000 persons canvassed			Percent of respiratory cases [1] complicated by pneumonia			Influenza and pneumonia death rate per 100,000 whole population		Estimated case fatality [2] deaths per 100 cases of— Respiratory conditions [1]		Estimated case fatality [2] deaths per 100 cases of— Pneumonia		
	Both sexes	Males	Females	Both sexes	Males	Females	Males	Females	Males	Females	Both sexes	Males	Females
All ages	4.88	4.73	5.01	2.70	2 90	2.55	100 6	96.3	0.62	0.49	20 2	21 3	19 2
Under 5	14.73	15 88	13.56	6 65	6 95	6 32	272 8	231.6	1 19	1 08	17 1	17 2	17.1
5 to 9	4.82	4.85	4.78	2 06	2 07	2 04	21 0	12 6	09	05	3.5	4 3	2 6
10 to 19	2 04	2 74	1 38	1.21	1 75	.77	18.2	20 2	.12	.11	9 4	6 6	14.6
20 to 29	2 38	1 70	2 94	1 44	1 28	1 52	38.1	33 0	29	.17	14.9	22.4	11.2
30 to 39	3.54	3 34	3.72	1.87	2.01	1,77	56 9	53.7	34	25	15 6	17 0	14 4
40 to 49	3.71	3 27	4.14	2.17	2 17	2.17	88 2	75 6	.59	40	22.1	27 0	18.3
50 to 59	5 72	5 55	5 88	3 55	3.95	3 25	134 2	99 6	.95	55	20 5	24 2	16 9
60 and over	10.65	8 51	12 37	6 32	6 29	6.34	397 2	440.9	2.94	2 26	39.5	46 7	35.6

[1] Respiratory cases referred to include influenza, grippe, pneumonia, and colds in bed

[2] Computed by relating the death rate in the whole population to the case rate in the canvassed population during the same period. Mortality data based on records copied from city health departments at time of survey

Table 14 and figure 7 show in broad age groups the pneumonia age curve in the different localities surveyed. Because of considerable variation in actual rates, the data have been plotted on a relative basis in the form of the ratio of the rate at each age to

PNEUMONIA CASE INCIDENCE - RELATIVE AGE CURVES

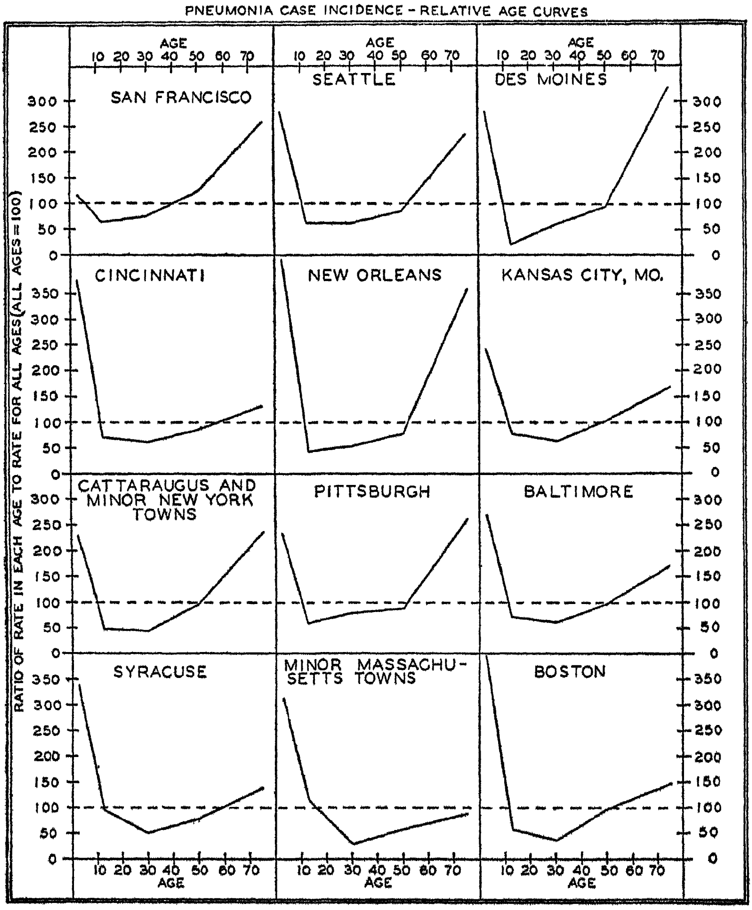

FIGURE 7.—Relative age incidence of pneumonia in each surveyed locality during the epidemic of 1928-29.

the rate for all ages. The numbers of cases of pneumonia are so small in the surveyed population of the individual cities that even in these broad age groups the curves can be taken as only very roughly indicating the nature of the age incidence of the disease. It will be noted, however, that there is no indication of a young adult peak in the pneumonia incidence in any locality.

TABLE 14.—*Age incidence of pneumonia during the epidemic of 1928–29 in canvassed families in certain localities in the United States*

Age	All localities [1]	All 10 cities	San Francisco	Seattle	Des Moines	Kansas City, Mo	New Orleans	Cincinnati	Pittsburgh	Baltimore	Syracuse	Cattaraugus County and minor towns in New York	Boston	Minor Massachusetts towns
	Case rates per 1,000 persons canvassed													
All ages	5 00	4 88	2 34	3 59	6 75	6 21	3 62	3 80	8 11	4 80	4 30	8 49	5 38	4 73
Under 5	14 80	14 73	2 72	9 88	18 66	14 82	14 97	14 30	18 62	13 02	14 59	19 42	21 34	14 69
5 to 19	3 24	3 00	1 49	2 22	1 24	4 82	1 55	2 79	4 62	3 57	4 22	4 18	3 20	5 54
20 to 39	2 88	2 96	1 78	2 20	3 80	3 96	1 92	2 35	6 35	3 03	2 19	3 80	1 99	1 40
40 to 59	4 56	4 53	2 84	3 01	6 21	6 46	2 84	3 24	7 07	4 80	3 29	8 28	5 31	2 74
60 and over	10 64	10 65	5 99	8 29	21 60	10 34	12 90	5 03	21 13	8 37	6 02	20 18	7 98	4 14
	Number of cases													
All ages [2]	756	651	35	42	66	63	54	44	128	79	46	54	94	48
Under 5	186	162	3	9	15	11	20	12	24	17	13	10	38	14
5 to 19	129	104	5	7	3	11	6	8	20	15	12	8	17	16
20 to 39	141	131	9	8	12	14	10	9	34	16	8	6	11	4
40 to 59	156	137	10	9	15	16	8	9	25	18	8	12	19	6
60 and over	136	112	7	8	21	9	10	6	25	12	5	18	9	5

[1] All localities includes Farmington, Mo (3 cases), which is not shown separately
[2] All ages includes some of unknown age

SEX

Table 13 and figure 6 show by age the pneumonia incidence and the percentage of respiratory cases complicated by pneumonia for the two sexes separately. In these curves for the 10 cities combined it will be noted that there is little difference between the sexes in the incidence of pneumonia; but what slight difference exists is in favor of the males, the rate for females being slightly above that for males in all of the age groups over 20 years. Expressed as a percentage of the respiratory cases, there is practically no difference between the sexes in the proportion of the cases that were complicated by pneumonia.

TABLE 15.—*Incidence of pneumonia among males and females in canvassed families during the whole period [1] covered by the survey, epidemic of 1928–29*

	Pneumonia case rate per 1,000			Percent of respiratory cases [2] complicated by pneumonia			Number of weeks [1] covered by the sickness records
	Male	Female	Ratio of female to male rate (male rate = 1.00)	Male	Female	Ratio of female to male rate (male rate = 1.00)	
San Francisco	2.80	1.92	0.69	1.86	1.12	0.60	14.0
Seattle	3.92	3.29	.84	1.96	1.36	.69	10.7
Des Moines	6.06	7.38	1.22	2.10	2.32	1.10	11.0
Kansas City, Mo.	5.08	7.27	1.43	2.89	3.65	1.26	9.9
Farmington, Mo.	1.76	3.05	1.73	.87	1.20	1.38	10.3
New Orleans	4.22	3.11	.74	2.60	1.59	.61	13.9
Cincinnati	3.71	3.88	1.05	2.70	2.17	.80	9.3
Pittsburgh	7.09	9.05	1.28	4.48	4.48	1.00	9.3
Baltimore	4.68	4.91	1.05	3.98	3.14	.79	11.6
Syracuse	3.98	4.62	1.16	2.43	2.43	1.00	10.3
Cattaraugus County	10.27	10.52	1.02	3.16	2.83	.90	13.0
Minor New York towns	7.14	3.33	.47	2.50	1.13	.45	12.6
Boston	5.45	5.32	.98	3.96	3.14	.80	10.4
Minor Massachusetts towns	4.56	4.89	1.07	2.35	2.23	.95	12.0
Great Barrington	5.19	5.09	.98	2.44	2.25	.92	11.3
Palmer	3.26	4.54	1.39	1.61	2.06	1.28	12.3
Saugus	6.43	7.75	1.21	3.24	3.34	1.03	14.6
Nantucket	3.36	2.26	.67	2.03	1.13	.56	13.4
All 10 cities	4.73	5.01	1.06	2.90	2.55	.88	11.1
All localities	4.89	5.10	1.04	2.84	2.49	.88	11.3

[1] In each city the period for which sickness records were made included the weeks during which respiratory conditions appeared to be definitely above normal in that particular locality.
[2] Respiratory cases referred to include influenza, grippe, pneumonia and colds in bed.

Table 15 shows pneumonia rates for each surveyed locality for males and females of all ages and the ratio of the rate among females to that among males. Considering the 10 cities, these sex ratios vary from 1.43 for Kansas City to 0.69 for San Francisco, with an average for all 10 cities of 1.06. Similarly, in the percentage of respiratory cases complicated by pneumonia, the indications are that there is little or no difference between the sexes.

COLOR

Table 16 shows for the six cities in which 500 or more colored persons were surveyed the pneumonia rates for white and colored and the percentage of cases that were complicated by pneumonia. Considering all six of these cities together, the colored case rate was 5.5 per 1,000, as compared with 5.3 for the white, an incidence that was practically identical in the two races. In New Orleans, where the largest number of colored persons was surveyed, the pneumonia incidence among the colored was 40 percent in excess of the white rate; but in Baltimore, the other city with a large colored population, the

rate was only 5 percent in excess of the white rate The large excess of the white respiratory rate over the colored has already been considered. When the pneumonia cases that occurred with about an equal frequency in the two races are related to the respiratory cases, the result indicates that the proportion of respiratory cases that were complicated by pneumonia is much greater among the colored than among the white Among the white in these six cities the pneumonia cases constituted 3 1 percent of the respiratory cases, as compared with 5 3 percent among colored persons, an excess of 75 percent for the colored race This may be a real difference indicating a greater probability of a minor respiratory condition progressing into pneumonia among the colored, or it may be merely an indication of the incompleteness with which minor respiratory conditions were reported among the colored race.

TABLE 16—*Incidence of pneumonia among white and colored canvassed families during the whole period* [1] *covered by the survey, epidemic of 1928–29*

	Pneumonia case rate per 1,000			Percent of respiratory cases [2] complicated by pneumonia			Number of weeks[1] covered by the sickness records
	White	Colored	Ratio of colored to white rate (white rate =1 00)	White	Colored	Ratio of colored to white rate (white rate =1 00)	
All 6 cities	5 33	5 50	1 03	3 06	5 34	1 75	10 9
New Orleans	3 24	4 54	1 40	1 58	3 70	2.34	13 9
Baltimore	4 76	4 99	1 05	3 07	7 77	2.53	11 6
Boston	5 38	5 42	1 01	3 42	5 26	1 54	10.4
Pittsburgh	8.16	7 41	91	4 35	8.25	1 90	9 4
Kansas City, Mo	5 78	11 19	1 93	3 03	7 20	2 38	9 9
Cincinnati	3 80	3 88	1 02	2 35	3 63	1 54	9 3

[1] In each city the period for which sickness records were made included the weeks during which respiratory conditions appeared to be definitely above normal in that particular locality

[2] Respiratory cases referred to include influenza, grippe, pneumonia, and colds in bed

MORTALITY AND CASE FATALITY

Table 17 shows the mortality from influenza and pneumonia in the whole population of the 10 surveyed cities during the 10 consecutive weeks with the highest excess death rates from those causes The table also shows the excess over the expected mortality during this 10-week period, the expected, or normal, being based on the median rates in the given city for the same season of the year during the 7 years 1921–1927.

TABLE 17.—*Mortality from influenza and pneumonia in the whole populations of surveyed cities during the 10 consecutive weeks with the highest excess influenza-pneumonia death rates during the epidemic of 1928–29*

City	Death rate per 100,000 from influenza and pneumonia: Total	Death rate per 100,000 from influenza and pneumonia: Excess [1]	Date of beginning and end of 10-week period	City	Death rate per 100,000 from influenza and pneumonia: Total	Death rate per 100,000 from influenza and pneumonia: Excess [1]	Date of beginning and end of 10-week period
			1928–29				1928–29
San Francisco	39.4	20.8	Oct. 28–Jan. 5	Pittsburgh	199.8	145.5	Dec. 9–Feb. 16.
Seattle	56.2	37.8	Nov. 25–Feb. 2	Baltimore	104.5	44.5	Dec. 23–Mar. 2.
Des Moines	98.5	78.6	Dec. 2–Feb. 9	Syracuse	74.1	43.9	Dec. 16–Feb. 23
Kansas City, Mo	84.4	49.9	do	Boston	98.3	55.2	Dec. 30–Mar. 9
New Orleans	131.4	84.2	Nov. 25–Feb. 2	All 10 cities [2]	103.5	61.7	
Cincinnati	119.8	77.3	Dec. 16–Feb. 23				

[1] Excess over a normal or expected rate based on the median for the same season during the years 1921–27. See footnote to table 2 for further details. Because the actual weekly rates both before and after the epidemic period were below the expected weekly rates (see table 2), the following corrections in the expected weekly mortality were made in computing the total excess mortality: San Francisco, 0.50, Des Moines, 1.00, Kansas City, 0.50, Pittsburgh, 2.00. In other words, the excess mortality for each week was measured from an expected rate that was less, by the amount of the correction, than the median for the corresponding week for the period 1921–27.

[2] Weighted average of the rates for the 10 cities, weights being proportional to the size of the canvassed population of the city. Since these are averages of rates for the *highest* 10 weeks in each city, they give a higher total than a cumulation of weekly rates for the cities as a whole, as in table 6, where the same calendar weeks are used for every city. Moreover, for certain cities a correction (see note above) was made in the median mortality used as an expected rate, but in the data for the 10 cities as a unit, no correction was necessary. This correction changes the excess, but not the total, rate.

The data in this table are summarized from table 2, which is based on current weekly reports published in the Public Health Reports and in the Weekly Health Index of the Bureau of the Census. A comparison of these provisional deaths with more final tabulations based on records copied from the city health departments at the time of the survey indicates some discrepancies between the two sets of data. Comparing the provisional weekly reports with deaths credited *primarily* to influenza or pneumonia for the whole period of the survey, in 5 of the 10 cities the provisional weekly reports exceeded the other figures by 8 to 30 percent. In the other 5 cities the provisional results were within 5 percent above or below the more final figures. The provisional results for the 10 cities combined were 7 percent above the other figures. The discrepancies appear to be largely due to reporting pneumonias that in the final tabulations are not classed as *primary* causes of death.

Mortality rates in table 18 are for the whole period for which illness was recorded, but for the reasons given above are generally lower than those in this table.

The total influenza and pneumonia mortality in these 10 cities during the 10 weeks varied from 39 per 100,000 in San Francisco to 200 per 100,000 in Pittsburgh. The excess varied from 21 per 100,000 in San Francisco to 146 per 100,000 in Pittsburgh. The fact that the mortality in these 10 cities is considerably above the average in larger groups of cities has been discussed in a preceding section.

For the 10 cities as a whole the indications are that about one half of 1 percent of the cases were fatal (0.54). This figure varied in the different cities from 0.22 in Des Moines to 0.94 percent in Pittsburgh.

AGE

Table 18 shows for each city the mortality rates by age in the whole population and an estimated case fatality rate by age which was obtained by relating the mortality in the whole city to the case incidence in the canvassed portion of the same city. Figure 8 shows for the 10 cities combined these mortality and case fatality rates and also the case fatality of pneumonia obtained by a similar method.

Figures 9 and 10 show similar rates for each of the 10 surveyed cities, figure 9 referring to mortality rates and figure 10 to the estimated case fatality of respiratory conditions. In both figures the

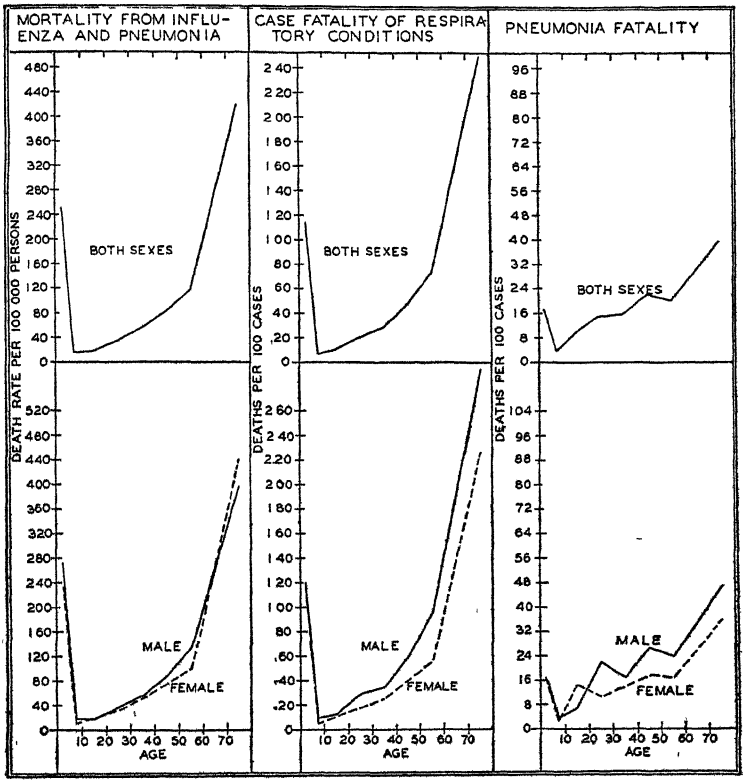

FIGURE 8.—Mortality and case fatality of influenza and pneumonia for various age and sex groups in the 10 surveyed cities during the epidemic of 1928–29 (See tables 13 and 18 for details of computation Vertical scales arranged so that rate for all ages plots at same height from base line on each chart)

data are plotted on a relative basis in the form of the ratio of the rate at each age to the rate for all ages. As noted in connection with pneumonia incidence, there is in none of these curves any indication of high rates in the young adult ages.

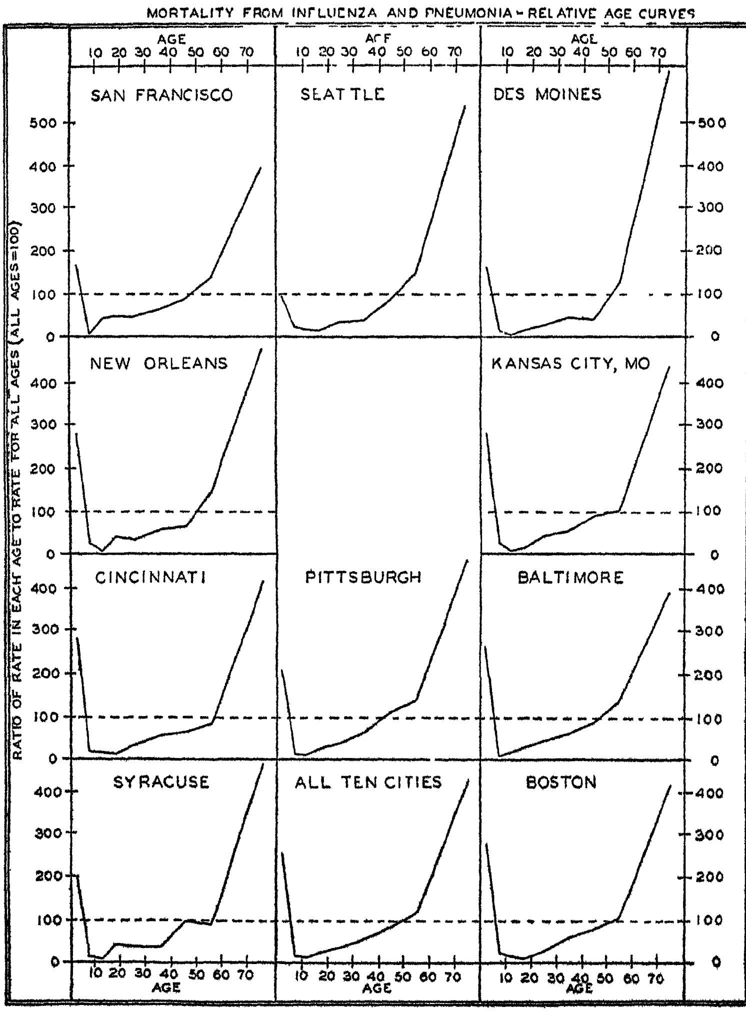

Figure 9.—Relative mortality from influenza and pneumonia at various ages in the whole population of each surveyed city during the epidemic of 1928–29.

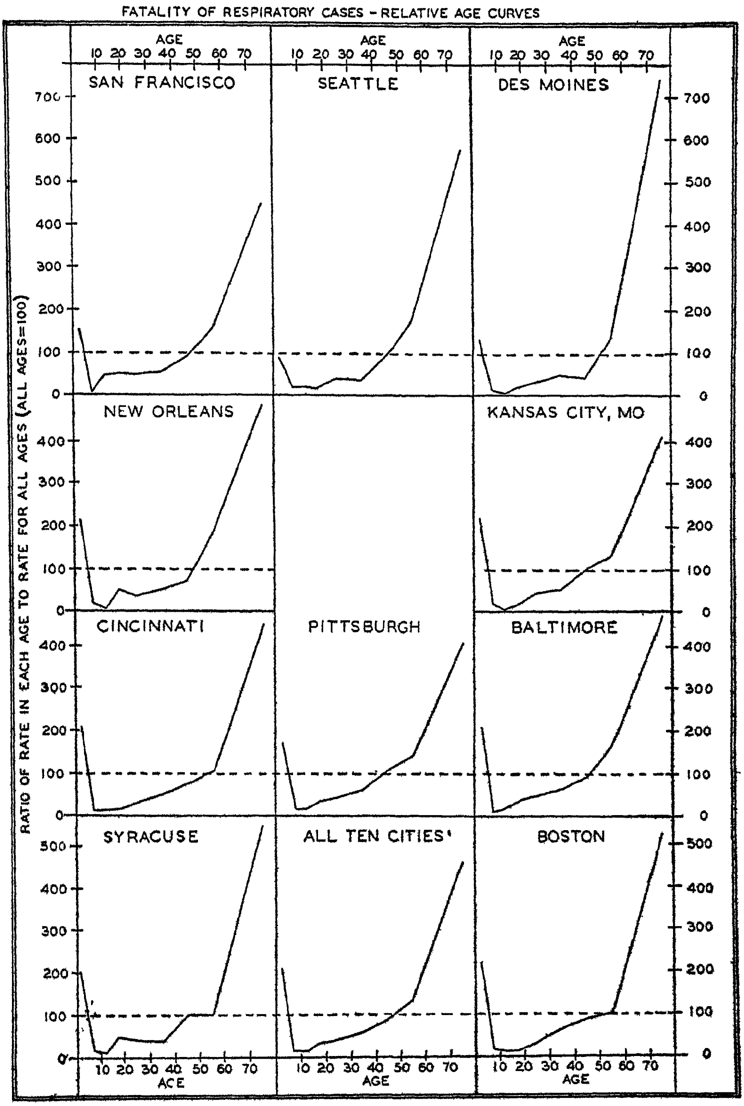

FIGURE 10—Relative fatality of respiratory conditions at various ages in each surveyed city during the epidemic of 1928–29 (See table 18 for details of computation)

TABLE 18—*Mortality and estimated case fatality from influenza at different ages in each of the 10 surveyed cities during the epidemic of 1928–29*

Age	All 10 cities	San Francisco	Seattle	Des Moines	Kansas City, Mo	New Orleans	Cincinnati	Pittsburgh	Baltimore	Syracuse	Boston
	Estimated case fatality deaths per 100 respiratory cases [1]										
All ages	0 544	0 258	0 246	0 222	0 436	0 658	0 630	0 943	0 788	0 393	0 652
Under 5	1 137	398	207	279	958	1 375	1 310	1 606	1 632	778	1 437
5 to 9	072	012	038	020	083	122	084	118	015	053	.118
10 to 14	073	116	038	--------	020	044	089	128	109	031	080
15 to 19	163	132	036	034	059	335	102	305	272	183	.085
20 to 29	214	121	088	060	181	236	215	383	364	151	212
30 to 39	293	136	082	096	224	342	327	556	478	141	428
40 to 49	480	225	219	090	443	470	490	1 020	708	385	567
50 to 59	727	392	414	296	556	1 188	673	1 309	1 297	385	661
60 and over	2 503	1 156	1 409	1 635	1 799	3 193	2 841	3 804	3 696	2 143	3 430
	Estimated pneumonia fatality deaths per 100 pneumonia cases [2]										
All ages	20 2	17 7	15 2	10 0	13 2	32 9	26 4	21 0	22 7	16 2	18 7
	Influenza and pneumonia death rate per 100,000 [3]										
All ages	98 4	41 5	54 5	67 6	81.9	119 1	100 2	170 7	108 8	69 5	100 4
Under 5	252 5	68 9	51 2	110 0	230 9	332 7	285.6	353 3	288 9	139 3	283 2
5 to 9	16 8	2.7	11.6	8.2	21.1	28 2	17.6	22.7	8 3	11.4	24.2
10 to 14	13 5	16 8	7.8	--------	3 8	8 2	15 7	19 6	17 6	5.7	13 9
15 to 19	24 7	19.1	7 1	8 6	10 3	48 0	14 4	43 7	31 2	30 1	10.7
20 to 29	35 5	18 7	17 2	15 9	32 6	39 9	32 9	64 0	46 9	25 9	29 0
30 to 39	55 3	25 8	19 7	29 3	42 7	67 1	56 6	105 6	66 4	25 7	60 0
40 to 49	82 1	35 8	45 2	26 4	71 6	74 7	63 7	191 8	94 9	66 5	77.2
50 to 59	117.1	55 2	79 9	82 1	83 4	174 7	83 5	235.7	146 6	62.8	104 4
60 and over	420 4	161.8	291 6	416 8	356.1	571.6	414 9	795 1	425 0	325.8	418 5
	Number of deaths from influenza and pneumonia [3]										
All ages [4]	4,772	257	196	95	320	536	446	1,133	866	148	780
Under 5	906	22	11	12	59	126	93	200	185	22	176
5 to 9	67	1	3	1	6	12	6	14	6	2	16
10 to 14	51	6	2		1	3	5	12	12	1	9
15 to 19	98	8	2	1	3	10	5	27	21	5	7
20 to 29	319	23	11	4	25	36	27	76	68	9	40
30 to 39	470	32	13	7	32	52	48	116	90	9	76
40 to 49	557	36	25	5	41	43	40	167	99	19	82
50 to 59	551	38	32	11	32	64	38	138	104	13	81
60 and over	1,750	90	96	54	121	180	189	383	281	63	293

[1] Percentage that death rate in the whole population is of the case rate for influenza, grippe, pneumonia, and colds in bed in the canvassed population during the same period. The length and date of the period varied in different localities (See tables 1 and 10 for dates and lengths of periods) Deaths refer to those occurring within this period regardless of the onset of the case causing death.

[2] Percentage that death rate in the whole population is of the pneumonia case rate in the canvassed population during the same period.

[3] In the whole population of the city, including only deaths due primarily to influenza or pneumonia. Mortality data based on records copied from city health departments at time of survey.

[4] All ages includes a few of unknown age.

SEX

Table 13 and figure 8 contain, for the 10 cities combined, mortality and case fatality rates by age and sex. Apparently there is very little difference between the sexes with respect to mortality from influenza and pneumonia. Although the rates in these 10 cities are slightly higher for males from 20 to 60 years of age, the rate for females above

60 is slightly above that for males. When the deaths are related to the respiratory cases, it appears that for all ages above 5 years the percentages of cases that are fatal are slightly greater for males than for females. It has already been mentioned that the informants were usually women and they may have remembered their own minor illnesses better than those of others in the household. The excess in the case fatality for males may be an expression of the greater completeness of minor respiratory cases for the females rather than any real difference in the percentage of cases that terminated fatally in the two sexes. Considering pneumonia fatality, however, the same error would not seem to be present, since it probably can be assumed that pneumonia was rather completely reported to the canvassers. It will be noted that for all ages above 20 years pneumonia fatality was slightly higher for males than for females.

TABLE 19.—*Mortality from influenza and pneumonia among males and females in the whole populations of surveyed cities during the whole period[1] for which illness was recorded, epidemic of 1928–29*

City	Death rate per 100,000 from influenza and pneumonia			Estimated case fatality,[2] deaths per 100 respiratory cases			Estimated pneumonia fatality deaths per 100 pneumonia cases			Number of weeks[1] covered by the sickness and mortality records
	Male	Female	Ratio of female to male rate (male rate =1 00)	Male	Female	Ratio of female to male rate (male rate =1 00)	Male	Female	Ratio of female to male rate (male rate =1 00)	
San Francisco	45 2	37.4	0 83	0 30	0 22	0 73	16 1	19 5	1 21	14 0
Seattle	62 9	46 0	73	31	19	61	16 0	14 0	85	10 7
Des Moines	72.6	63 0	87	25	20	80	12 0	8 5	.71	11 0
Kansas City, Mo	81 6	82 3	1 01	46	41	89	16 1	11 3	.70	9 9
New Orleans	120 4	117 9	98	74	60	81	28 5	37 9	1 33	13 9
Cincinnati	95 4	104 8	1 10	69	59	86	25 7	27 0	1.05	9 3
Pittsburgh	171 1	170 2	99	1 08	84	78	24 1	18 8	78	9 3
Baltimore	118.5	99 4	84	1 00	63	63	25 3	20.2	.80	11 6
Syracuse	72 6	66 5	92	44	35	80	18 2	14 4	79	10 3
Boston	100 7	100 1	99	73	59	81	18 5	18 8	1 02	10 4
All 10 cities	100 6	96 3	.96	.62	49	79	21 3	19 2	.90	11 1

[1] In each city the period for which sickness records were made included the weeks during which respiratory conditions appeared to be definitely above normal in that particular locality

[2] Computed by relating the death rate in the whole population to the case rate in the canvassed population of the city. Respiratory cases include influenza, grippe, pneumonia, and colds in bed.

Mortality data based on records copied from city health departments at time of survey

Table 19 shows for all ages combined the death rate from influenza and pneumonia among males and females and the case fatality estimated by the method already described. For the 10 cities combined the influenza and pneumonia mortality for females was 96 percent of that for males, this female-male ratio ranging in the different cities from 73 percent in Seattle to 110 percent in Cincinnati. The case fatality of respiratory conditions for females was 79 percent of that for males, with a range in this female-male ratio from 61 percent in Seattle to 89 percent in Kansas City. The case fatality of pneumonia in the 10 cities combined was for females 90 percent of that for males, with a range in this female-male ratio from 70 percent in Kansas City to 133 percent in New Orleans.

COLOR

Table 20 compares white and colored persons with respect to mortality and case fatality in six cities with 500 or more colored persons in the surveyed population. Considering the whole population of the six cities combined, the colored death rate from influenza and pneumonia during the period of the epidemic was 56 percent higher than the white rate In every one of these six cities the colored death rate was higher than the white, the excess for colored ranging from 26 percent in Boston to 101 percent in Kansas City. As regards the proportion of respiratory cases that were fatal, the indications are that in the six cities combined, 2 7 times as many cases were fatal among colored as among white patients, the ratio varying in the different cities from 1 9 in Boston to 4.2 in Baltimore. Mention has already been made of the possibility that the minor respiratory cases were less completely reported to the canvassers by the colored families than by the white, and, if such was the case, a part or all of this large excess in the indicated case fatality would be due to the incompleteness of respiratory cases. However, the indications are that pneumonia, which was presumably well reported by both races, was also considerably more fatal to colored than to white patients. Considering the six cities combined, the estimated pneumonia fatality of colored patients is indicated as 51 percent in excess of the fatality of white patients. In every one of these cities the colored pneumonia fatality is in excess of that of the whites, the relative excess ranging from 4 percent in Kansas City to 68 percent in Baltimore In New Orleans, where, like Baltimore, the number of surveyed Negroes was large, the excess was only 12 percent.

TABLE 20.—*Mortality from influenza and pneumonia among white and colored in the whole populations of surveyed cities during the whole period [1] for which illness was recorded, epidemic of 1928–29*

City	Death rate per 100,000 from influenza and pneumonia			Estimated case fatality [2] deaths per 100 respiratory cases			Estimated pneumonia fatality [2] deaths per 100 pneumonia cases			Number of weeks [1] covered by sickness and mortality records
	White	Colored	Ratio of colored to white rate (white rate =1 00)	White	Colored	Ratio of colored to white rate (white rate =1 00)	White	Colored	Ratio of colored to white rate (white rate =1 00)	
All 6 cities	108 4	168 8	1 56	0 62	1 64	2 65	20.3	30 7	1 51	10 9
New Orleans	102.3	161 0	1 57	.50	1.31	2.62	31 6	35.5	1 12	13.0
Baltimore	95.9	168 6	1 76	.62	2 63	4.24	20 1	33.8	1 68	11 6
Boston	99 6	125 5	1 26	63	1.22	1 94	18.5	23 1	1.25	10 4
Pittsburgh	164 9	234 5	1.42	88	2 61	2.97	20 2	31 6	1 56	9.4
Kansas City, Mo	74.1	148.6	2 01	39	96	2.46	12.8	13.3	1 04	9.9
Cincinnati	94 0	151 9	1.62	58	1 42	2.45	24.7	39.1	1 58	9.3

[1] In each city the period for which sickness records were made included the weeks during which respiratory conditions appeared to be definitely above normal in that particular locality

[2] Computed by relating the death rate in the whole population to the case rate in the canvassed population of the city. Respiratory cases include influenza, grippe, pneumonia, and colds in bed.

Mortality data based on records copied from city health departments at time of survey.

SUMMARY

This paper summarizes the extent and severity of the morbidity and mortality from influenza and related conditions for different age, sex, and color groups in each of 14 localities surveyed immediately after the epidemic of 1928–29. From 10,000 to 15,000 persons were included in each of the 10 cities surveyed and the total population covered was more than 150,000.

Chronologically, the high incidence of respiratory conditions was paralleled in every community by an excess mortality from influenza and pneumonia with its peak 1 to 2 weeks after the morbidity peak A high morbidity peak, however, did not necessarily indicate a high mortality peak for the same community. In one surveyed city, San Francisco, neither the morbidity nor mortality showed any definite peak (fig. 1)

Considering the different diagnoses as reported by the households, the chronological variations in the incidence of influenza, grippe, pneumonia, and colds in bed were all similar, with peaks in the same week (fig. 2). In the eastern cities the diagnosis of grippe was more frequent than in the west, where the designation of influenza was more common.

For the 10 highest weeks of the epidemic the case rate for influenza and related conditions varied in the different cities from 110 to 298 per 1,000.

There is considerable variation in the age curve of influenzal conditions in the different localities, but nearly all places show a double peak in the curve, the first at 5–9 and the second at 30–39 years of age (fig 5).

The case rate for influenzal conditions for females was 19 percent above that for males. The female rate was consistently higher in the different localities. Under 10 years of age the rates for males and females were approximately the same. Part of the difference in the adult ages may be due to more complete reporting of their own minor illnesses by the adult women, who were usually the informants.

The case rate for influenzal conditions for colored persons was 41 percent less than for whites in the same cities. The lower colored rate was consistently true in the various cities. How much if any of the difference was due to poorer reporting to the canvasser on the part of the colored families cannot be determined.

For the 10 highest weeks of the epidemic the pneumonia case rate varied in the 10 cities from 1.8 to 7.8 per 1,000 persons canvassed. The proportion of respiratory cases complicated by pneumonia varied in the 10 cities from 1.5 to 3.5 percent.

Pneumonia showed no peak at the young adult ages. The highest rates were for the youngest and oldest age groups (fig. 7).

There was little difference between the sexes in pneumonia incidence, the female rate being 6 percent above the male rate. In the adult ages the rate for females was slightly higher than for males, but the reverse was true under 20 years of age (fig. 6).

There was little difference in the pneumonia incidence among white and colored persons, the colored rate being 3 percent above the white in the same cities

The mortality from influenza and pneumonia during the 10 highest weeks of the epidemic varied in the different cities from 39 to 200 per 100,000 The ratio of the highest to the lowest city of more than 5 to 1 may be contrasted with the ratio of less than 3 to 1 for respiratory cases In pneumonia incidence, however, the ratio was 4.3 to 1, or nearly the same as for mortality

The indicated case fatality for respiratory conditions varied from 0 22 to 0.91 percent, and the pneumonia fatality varied from 10 to 33 percent in the different cities.

Neither the mortality nor the estimated case fatality showed any peak at the young adult ages. The highest rates came at the oldest ages and the next highest at the youngest ages (figs. 9 and 10).

Mortality from influenza and pneumonia for males and females was about the same

The mortality rate for the colored population was 56 percent higher than for the white population of the same cities. The colored excess over the white rate was large in each city.

ACKNOWLEDGMENTS

This study was made as one of a series of studies of influenza under the general direction of the United States Public Health Service Board for the Study of Respiratory Diseases, consisting of Consultant W. H. Frost, Principal Statistician Edgar Sydenstricker, and Senior Statistician Selwyn D Collins. In the preparation of the study the author has had the advice and assistance of the other members of this board and of the statistical staff of the Office of Statistical Investigations and associated offices of the Public Health Service.

The collection of the data for 1928 29 was done under the general direction of Surg M. V. Veldee. In each city surveyed, a medical officer of the United States Public Health Service already stationed in or near that city was designated to take charge of the collection of the data in his locality. All forms and instructions for enumerators and others engaged in the work were prepared in Washington and forwarded to the officers in charge, and so the procedure followed was reasonably uniform.

The following Public Health Service officers conducted the surveys in the respective cities: San Francisco, Medical Director R. H. Creel;

Seattle, Medical Director L. D. Fricks, assisted by Passed Asst. Surg. F. S. Fellows; Kansas City and Farmington, Passed Asst Surg E R. Coffey; Des Moines, Passed Asst Surg A. S. Rumreich; New Orleans, Surg. William C Rucker, assisted by Surg W. Y. Hollingsworth; Cincinnati, Senior Surg R. Olesen; Pittsburgh, Passed Asst. Surg. R R. Jones; Syracuse, Surg. M V Veldee, Baltimore, Consultant W. H. Frost; Boston, Medical Director J. W. Schereschewsky. Surgeon Veldee also assisted in the surveys in Pittsburgh, Baltimore, and Boston The surveys in the rural and small town communities of New York and Massachusetts were conducted by the State and local health departments of those States. In all cities the local health department gave full cooperation in the study.

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(3) Collins, Selwyn D Influenza-pneumonia mortality in a group of about 95 cities in the United States, 1920–29 Pub Health Rep, Feb 21, 1930. (Reprint 1355)

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Preceding Papers on the Epidemiology of Influenza

Preceding papers from the Office of Statistical Investigations dealing with various phases of the epidemiology of influenza are listed below:

Excess mortality from causes other than influenza and pneumonia during influenza epidemics. By Selwyn D. Collins Pub. Health Rep, Nov 11, 1932. (Reprint 1553.)

The incidence and time distribution of common colds in several groups kept under continuous observation. By W H. Frost and Mary Gover. Pub Health Rep., Sept 2, 1932 (Reprint 1545.)

The incidence of epidemic influenza, 1918–19 By Rollo H. Britten Pub. Health Rep., Feb 5, 1932.

Age and sex incidence of influenza and pneumonia morbidity and mortality in the epidemic of 1928–29, with comparative data for the epidemic of 1918–19. By Selwyn D Collins. Pub. Health Rep, Aug. 14, 1931 (Reprint 1500)

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Influenza-pneumonia mortality in a group of about 95 cities in the United States, 1920–29 By S D Collins. Pub Health Rep, Feb 21, 1930 (Reprint 1355)

Morbidity in the influenza epidemic of 1928–29 By M V Veldee Pub Health Rep, May 10, 1929 (Reprint 1282)

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Statistics of influenza morbidity. By W. H. Frost. Pub Health Rep., Mar. 12, 1920 (Reprint 586)

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Epidemic influenza in foreign countries. By W H Frost and Edgar Sydenstricker Pub Health Rep, June 20, 1919 (Reprint 537)

Influenza in Maryland. By W H Frost and Edgar Sydenstricker Pub. Health Rep, Mar 14, 1919. (Reprint 510.)

A comparison of the mortality rates by weeks during the influenza epidemic of 1889–90 and during the primary stage of the influenza epidemic of 1918 in 12 cities in the United States. Pub Health Rep., Jan 31, 1919. (Reprint 502.)

Preliminary statistics of the influenza epidemic. By Edgar Sydenstricker. Pub Health Rep, Dec. 27, 1918

DEATHS DURING WEEK ENDED DEC. 16, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec. 16, 1933	Corresponding week 1932
Data from 85 large cities of the United States:		
Total deaths	8,500	8,861
Deaths per 1,000 population, annual basis	11 9	12.6
Deaths under 1 year of age	591	649
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	51	53
Deaths per 1,000 population, annual basis, first 50 weeks of year	10.9	11.1
Data from industrial insurance companies:		
Policies in force	67,329,101	69,459,495
Number of death claims	14,271	13,769
Death claims per 1,000 policies in force, annual rate	11.1	10.4
Death claims per 1,000 policies, first 50 weeks of year, annual rate	9.8	9.5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Dec. 23, 1933, and Dec. 24, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec 23, 1933, and Dec. 24, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec 23, 1933	Week ended Dec 24, 1932	Week ended Dec 23, 1933	Week ended Dec 24, 1932	Week ended Dec 23 1933	Week ended Dec. 24, 1932	Week ended Dec 23, 1933	Week ended Dec 24, 1932
New England States								
Maine	2		9	2	2	2	0	0
New Hampshire			2		174		0	1
Vermont		1			55	1	0	0
Massachusetts	16	37		8	511	140	2	2
Rhode Island	3	2		2			0	0
Connecticut	2	15	5	24	5	18	3	1
Middle Atlantic States.								
New York	51	52	[1] 9	[1] 177	467	441	2	5
New Jersey	19	29	29	50	32	170	0	1
Pennsylvania	67	113			171	261	1	3
East North Central States								
Ohio	38	30	16	47	80	341	1	0
Indiana	34	59	49	1,454	39	13	1	5
Illinois	49	73	10	336	43	42	3	14
Michigan	17	25	3	74	29	271	2	0
Wisconsin	12	7	32	492	155	409	0	0
West North Central States								
Minnesota	5	9		45	20	271	1	1
Iowa [2]	9	25	4	8	10		2	0
Missouri	41	15	7	384	108		1	3
North Dakota	2	6			19	131	0	1
South Dakota	2	3		208	310		0	0
Nebraska	5	16		941	5	18	0	1
Kansas	34	21			25	9	0	2
South Atlantic States								
Delaware			1	3	2	1	0	0
Maryland [2]	18	18	27	353	33	3	0	0
District of Columbia	15	3	4	54	15	2	2	0
Virginia	42	11			73	92	0	3
West Virginia	38	24	63	517	20	150	3	0
North Carolina [3]	71	22	19	340	649	62	2	1
South Carolina	19	5	433	1,060	97	43	0	0
Georgia [3]	25	11		2,429	524		0	1
Florida	15			53		1	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec. 23, 1933, and Dec 24, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec 23, 1933	Week ended Dec 24, 1932	Week ended Dec 23, 1933	Week ended Dec 24, 1932	Week ended Dec 23, 1933	Week ended Dec 24, 1932	Week ended Dec 23, 1933	Week ended Dec 24, 1932
East South Central States								
Kentucky	40	29	4	1,004	14		0	7
Tennessee [2]	44	22	54	2,945	173	6	2	0
Alabama [3]	28	22	27	3,965	48	1	0	1
Mississippi [2]	18	9					0	1
West South Central States:								
Arkansas	17	12	8	9,795	123	4	0	1
Louisiana [3]	23	23	4	9,162	3		0	1
Oklahoma [4]	26	11	29	2,203	13		4	0
Texas [3]	163	84	145	2,838	140	361	0	0
Mountain States								
Montana [5]	1	1	15	4,200		191	0	0
Idaho		3		2	4	2	0	0
Wyoming				243	20		0	0
Colorado	6	10	37	263	4	7	0	0
New Mexico	10	10	1	11	51		3	0
Arizona	5	1	12	33	5		0	0
Utah [2]		1		47	260	1	0	1
Pacific States.								
Washington	3	7		232	219	3	0	1
Oregon			13	1,552	14	39	0	0
California	30	39	34	1,068	209	48	0	4
Total	1,074	916	1,105	48,624	4,973	3,555	35	62

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec 23, 1933	Week ended Dec 24, 1932	Week ended Dec 23, 1933	Week ended Dec 24, 1932	Week ended Dec 23, 1933	Week ended Dec 24, 1932	Week ended Dec 23, 1933	Week ended Dec 24, 1932
New England States								
Maine	1	1	6	31	0	0	0	4
New Hampshire	0	0	22	16	0	0	0	0
Vermont	0	0	5	2	0	0	0	0
Massachusetts	1	0	200	309	0	0	2	6
Rhode Island	0	0	4	11	0	0	2	0
Connecticut	0	1	50	83	0	13	0	2
Middle Atlantic States								
New York	2	0	456	470	0	3	11	7
New Jersey	0	0	121	182	0	0	3	2
Pennsylvania	2	5	452	596	0	0	20	21
East North Central States:								
Ohio	4	1	383	236	0	17	5	2
Indiana	0	0	142	84	3	4	2	5
Illinois	4	1	387	390	1	1	4	4
Michigan	0	0	345	337	1	1	4	8
Wisconsin	2	0	116	76	29	3	2	0
West North Central States.								
Minnesota	0	0	49	70	1	0	2	0
Iowa [1]	0	0	81	40	0	19	0	1
Missouri	0	0	71	24	7	0	4	2
North Dakota	0	0	20	7	0	5	0	0
South Dakota	0	0	4	14	0	2	0	0
Nebraska	1	1	18	40	1	2	0	0
Kansas	2	4	132	73	4	2	3	5
South Atlantic States								
Delaware	1	0	6	10	0	0	1	0
Maryland [1]	0	0	70	94	0	0	4	7
District of Columbia	1	0	17	10	0	0	3	0
Virginia	0	0	79	52	0	1	3	6
West Virginia	2	0	115	61	3	0	10	7
North Carolina [3]	0	0	111	60	0	1	3	2
South Carolina	1	0	11	5	1	0	1	0
Georgia [3]	0	1	20	9	0	0	10	3
Florida	0	0	7	6	0	0	2	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec 23, 1933, and Dec 24, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec 23, 1933	Week ended Dec 24, 1932	Week ended Dec 23, 1933	Week ended Dec 24, 1932	Week ended Dec 23, 1933	Week ended Dec 24, 1932	Week ended Dec 23, 1933	Week ended Dec 24, 1932
East South Central States								
Kentucky	0	1	92	23	0	2	5	10
Tennessee [2]	0	0	76	26	1	1	2	4
Alabama [3]	0	0	24	28	1	1	5	0
Mississippi [2]	0	0	17	7	0	0	0	1
West South Central States								
Arkansas	0	0	17	11	2	0	2	2
Louisiana [3]	2	0	26	7	3	8	6	3
Oklahoma [4]	0	0	20	26	0	3	2	0
Texas [3]	0	0	123	78	2	6	24	2
Mountain States								
Montana [5]	0	1	7	8	1	0	4	1
Idaho	2	1	5	2	2	2	0	1
Wyoming	0	0	5	3	0	0	0	0
Colorado	0	0	26	28	6	0	9	0
New Mexico	1	0	38	11	0	0	4	1
Arizona	3	0	15	3	0	0	1	0
Utah [2]	0	0	14	19	3	0	0	0
Pacific States								
Washington	0	2	32	37	3	6	3	3
Oregon	0	0	32	16	13	0	4	1
California	1	2	157	134	4	4	33	6
Total	33	22	4,226	3,865	92	107	205	130

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended Dec 23, 1933, 42 cases, as follows North Carolina, 1, Georgia, 13, Alabama, 22, Louisiana, 1, Texas, 5
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended Dec 23, 1933, Montana 1 case

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November 1933										
Alabama	2	258	124	395	41	21	3	213	1	46
Arizona		26	130	3	74	1	4	87	1	7
Florida		65	6	135	6	3		20	0	5
Idaho	1	1	2		30		3	21	16	3
Illinois	28	184	92	21	85	1	5	1,592		63
Iowa	4	81			11		4	358	40	4
Louisiana	2	209	40	672	23	8	1	126	5	70
Maryland	2	107	42		17		7	408	0	50
New York	10	190		15	1,262		39	1,407	0	67
Oklahoma [1]	3	297	127	119	139	8	1	171	10	94
Pennsylvania	13	307		1	716		33	1,778	0	121
Rhode Island		13	1		4		0	68	0	1
South Carolina	2	297	1,442	939	245	106	4	53	1	39
Virginia		438	236	11	140	5	2	641	1	47
West Virginia	7	296	186		29		6	603	6	55

[1] Exclusive of Oklahoma City and Tulsa.

November 1933

	Cases
Actinomycosis	
Iowa	1
Anthrax	
Louisiana	1
Pennsylvania	1
Chicken pox	
Alabama	33
Arizona	33
Florida	13
Idaho	90
Illinois	1,575
Iowa	325
Louisiana	21
Maryland	317
New York	2,180
Oklahoma [1]	25
Pennsylvania	2,792
Rhode Island	44
South Carolina	39
Virginia	231
West Virginia	195
Conjunctivitis	
Arizona	16
Dengue	
Florida	3
Louisiana	2
South Carolina	3
Diarrhea	
Maryland	8
South Carolina	315
Diarrhea and dysentery	
Virginia	88
Dysentery	
Alabama (amœbic)	1
Arizona	42
Florida	3
Illinois (amœbic)	129
Illinois (bacillary)	10
Iowa	4
Louisiana	11
Maryland	28
New York	18
New York (amœbic)	29
Oklahoma [1]	9
Pennsylvania	6
Rhode Island (amœbic)	2
Rhode Island (bacillary)	1
Food poisoning	
Illinois	18
German measles	
Arizona	5
Illinois	25
Maryland	4
New York	38
Pennsylvania	37
Rhode Island	3
South Carolina	1
Hookworm disease:	
Louisiana	24

	Cases
Impetigo contagiosa	
Arizona	22
Maryland	65
Oklahoma [1]	4
Lead poisoning	
Illinois	4
Leprosy	
Alabama	1
Lethargic encephalitis	
Alabama	3
Illinois	13
Iowa	6
Louisiana	3
New York	21
Oklahoma [1]	2
Pennsylvania	14
South Carolina	3
Virginia	3
West Virginia	1
Mumps	
Alabama	9
Arizona	10
Idaho	1
Illinois	328
Iowa	22
Louisiana	7
Maryland	66
Oklahoma [1]	33
Pennsylvania	651
Rhode Island	1
South Carolina	24
Virginia	29
West Virginia	2
Ophthalmia neonatorum:	
Alabama	1
Arizona	1
Illinois	7
Maryland	3
New York	1
Oklahoma [1]	1
Pennsylvania	6
South Carolina	11
Virginia	1
Paratyphoid fever	
Illinois	2
New York	10
Rhode Island	1
South Carolina	5
Virginia	1
Psittacosis	
Virginia	1
Puerperal septicemia	
Illinois	1
Rabies in animals	
Illinois	17
Louisiana	21
South Carolina	16
Rabies in man:	
Oklahoma [1]	1
Scabies:	
Maryland	4
Oklahoma [1]	2
Septic sore throat:	
Illinois	20
Iowa	3
Maryland	12

	Cases
Septic sore throat—Con	
New York	21
Oklahoma [1]	36
Rhode Island	1
Virginia	5
Tetanus	
Alabama	8
Illinois	5
Louisiana	4
Maryland	2
New York	6
Trachoma	
Arizona	120
Oklahoma [1]	7
Trichinosis	
New York	12
Pennsylvania	1
Tularaemia	
Alabama	1
Illinois	15
Iowa	1
Louisiana	3
Maryland	3
Pennsylvania	2
Virginia	6
Typhus fever	
Alabama	92
Florida	4
Louisiana	2
Maryland	2
New York	4
Rhode Island	2
South Carolina	1
Undulant fever	
Idaho	2
Illinois	11
Iowa	10
Louisiana	1
Maryland	4
New York	19
Oklahoma [1]	1
Pennsylvania	2
Rhode Island	1
Virginia	1
Vincent's infection	
Illinois	34
Maryland	25
New York [2]	48
Oklahoma [1]	5
Whooping cough:	
Alabama	41
Arizona	50
Florida	15
Idaho	1
Illinois	687
Iowa	71
Louisiana	28
Maryland	321
New York	1,527
Oklahoma [1]	31
Pennsylvania	1,603
Rhode Island	163
South Carolina	171
Virginia	130
West Virginia	134

[1] Exclusive of Oklahoma City and Tulsa

[2] Exclusive of New York City

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec 16, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	5	0	0	0	0	5	20
New Hampshire											
Concord	0	------	0	0	2	0	0	0	1	0	10
Manchester	0	------	0	3	2	1	0	1	0	0	13
Nashua	0	------	0	0	0	5	0	0	0	4	--------
Vermont											
Barre	1	------	0	28	0	0	0	0	0	0	4
Burlington	0	------	0	0	0	3	0	0	2	9	9
Massachusetts											
Boston	2	------	1	153	31	48	0	10	0	27	241
Fall River	1	------	0	0	4	2	0	1	0	1	31
Springfield	0	------	0	1	1	7	0	2	0	20	33
Worcester	1	------	0	206	6	5	0	4	0	28	78
Rhode Island											
Pawtucket	0	------	0	0	0	0	0	0	0	0	17
Providence	1	------	0	1	4	13	0	0	1	19	61
Connecticut											
Bridgeport	0	1	2	2	3	8	0	1	0	4	38
Hartford	2	------	0	0	4	4	0	0	0	2	44
New Haven	0	2	0	1	2	1	0	0	0	2	40
New York											
Buffalo	1	------	2	131	22	18	0	9	0	31	143
New York	43	28	8	25	185	167	0	89	4	109	1,523
Rochester	1	------	1	1	7	7	0	0	0	5	55
Syracuse	0	------	0	0	5	4	0	1	1	39	50
New Jersey											
Camden	1	------	0	2	4	13	0	1	1	0	29
Newark	0	4	1	3	11	17	0	6	1	12	110
Trenton	0	------	0	0	3	9	0	4	0	2	40
Pennsylvania											
Philadelphia	4	13	10	215	52	62	0	26	1	59	565
Pittsburgh	16	2	3	2	18	37	0	8	1	27	151
Reading	0	------	0	4	2	8	0	0	0	2	26
Scranton	0	------	0	3	0	3	0	0	0	10	--------
Ohio											
Cincinnati	6	------	2	98	9	22	0	5	0	12	122
Cleveland	14	40	1	2	20	74	0	5	0	54	201
Columbus	3	2	2	2	7	24	0	2	0	6	68
Toledo	0	2	1	23	10	24	0	5	0	8	65
Indiana											
Fort Wayne	2	------	0	0	3	8	0	0	0	0	17
Indianapolis	6	------	0	4	7	15	0	2	0	20	--------
South Bend	0	------	0	0	3	3	0	2	0	0	17
Terre Haute	0	------	0	20	3	2	1	0	0	0	18
Illinois											
Chicago	1	4	5	7	85	176	0	42	2	75	728
Springfield	2	------	0	0	0	4	1	0	1	1	21
Michigan											
Detroit	9	3	2	8	31	61	0	15	0	71	262
Flint	0	------	0	2	7	29	0	0	0	5	28
Grand Rapids	0	------	0	1	0	9	0	3	0	0	38
Wisconsin											
Kenosha	0	------	0	1	1	14	0	0	0	8	7
Madison	0	------	--------	0	--------	1	0	--------	0	20	26
Milwaukee	7	------	0	1	9	20	0	3	0	33	90
Racine	0	------	0	0	0	10	0	0	0	6	18
Superior	0	------	0	0	0	0	0	0	0	0	6
Minnesota											
Duluth	0	------	0	0	3	0	0	0	1	0	22
Minneapolis	6	------	1	0	9	15	0	2	0	10	103
St. Paul	0	------	0	0	4	23	0	1	1	8	58
Iowa											
Des Moines	0	------	--------	0	--------	12	0	--------	0	0	30
Sioux City	1	------	--------	0	--------	1	0	--------	0	2	--------
Waterloo	0	------	--------	1	--------	1	0	--------	0	1	--------
Missouri:											
Kansas City	5	------	0	2	16	24	0	1	0	1	106
St Joseph	9	------	0	2	6	2	0	2	0	0	58
St. Louis	15	1	--------	97	17	16	0	13	0	11	176
North Dakota:											
Fargo	1	------	0	9	1	1	0	0	1	1	9
Grand Forks	0	------	0	0	0	0	0	0	0	0	9

City reports for week ended Dec 16, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
South Dakota											
Aberdeen	0	------	0	0	0	0	0	0	0	0	0
Nebraska											
Omaha	2	------	0	5	5	8	0	1	0	7	50
Kansas											
Topeka	0	------	0	0	2	5	0	0	0	6	19
Wichita	1	------	0	1	0	1	0	0	1	2	20
Delaware											
Wilmington	1	------	0	0	4	3	0	1	0	3	30
Maryland											
Baltimore	7	13	5	3	26	24	0	12	4	66	233
Cumberland	1	------	0	1	1	2	0	1	0	0	18
Frederick	0	------	0	0	0	0	0	0	1	0	2
District of Columbia											
Washington	10	1	0	25	28	14	0	8	1	9	177
Virginia:											
Lynchburg	4	------	0	0	3	3	0	0	0	0	12
Norfolk	1	47	0	0	0	7	0	0	1	------	34
Richmond	1	------	0	1	8	7	0	0	2	0	50
Roanoke	5	------	0	3	0	5	0	0	0	5	11
West Virginia											
Charleston	1	1	0	0	0	6	0	0	0	0	12
Huntington	2	------	0	0	0	25	0	0	0	0	------
Wheeling	0	------	0	1	1	7	0	2	0	1	25
North Carolina											
Raleigh	0	------	0	0	0	4	0	0	0	2	5
Wilmington	0	------	0	1	1	0	0	0	0	2	6
Winston-Salem	1	------	0	96	1	7	0	0	0	0	18
South Carolina:											
Charleston	0	23	1	0	3	2	0	1	0	5	20
Columbia	------	------	------	------	------	------	------	------	------	------	------
Greenville	0	------	0	0	2	0	0	0	0	1	10
Georgia											
Atlanta	4	20	1	4	13	6	0	2	0	3	84
Brunswick	1	------	0	1	1	0	0	0	0	0	4
Savannah	3	55	3	2	3	2	0	2	1	0	34
Florida:											
Miami	0	1	0	0	1	0	0	3	0	0	32
Tampa	1	------	0	0	3	1	0	0	0	0	22
Kentucky											
Ashland	0	------	------	1	------	2	0	------	0	0	------
Lexington	2	------	0	0	0	0	0	2	0	3	18
Louisville	10	------	0	0	11	19	0	4	0	5	80
Tennessee											
Memphis	6	------	4	9	4	9	0	4	2	0	94
Nashville	2	------	2	17	4	10	0	0	0	0	45
Alabama:											
Birmingham	7	1	1	0	9	9	0	6	1	1	62
Mobile	1	------	0	0	0	0	0	1	0	0	22
Montgomery	2	------	------	0	------	3	0	0	0	0	
Arkansas											
Fort Smith	------	------	------	------	------	------	------	------	------	------	------
Little Rock	1	------	0	9	4	1	0	1	1	0	6
Louisiana:											
New Orleans	9	4	0	0	13	4	0	12	0	1	156
Shreveport	2	------	0	1	3	3	0	2	0	0	38
Texas:											
Dallas	17	------	0	0	5	0	0	2	3	8	54
Fort Worth	6	------	1	0	3	13	0	0	1	2	33
Galveston	2	------	0	0	3	1	0	0	0	0	18
Houston	12	------	0	0	8	7	1	7	1	0	99
San Antonio	2	------	0	0	7	4	0	8	0	0	75
Montana											
Billings	0	------	0	0	0	0	0	0	0	1	3
Great Falls	0	------	0	0	0	0	0	0	0	3	5
Helena	0	------	0	0	0	0	0	0	0	0	3
Missoula	0	------	0	0	0	0	0	0	1	0	2
Idaho:											
Boise	1	------	0	0	2	0	0	0	0	0	4
Colorado											
Denver	2	29	0	2	4	11	2	4	0	30	67
Pueblo	------	------	------	------	------	------	------	------	------	------	------
New Mexico:											
Albuquerque	1	------	0	0	0	1	0	3	0	0	12

City reports for week ended Dec 16, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Utah											
Salt Lake City	0		0	125	2	7	0	1	0	14	28
Nevada											
Reno	0	1	0	0	0	0	0	0	0	0	7
Washington											
Seattle	5			0		10	0		1	54	
Spokane	0			208	2	2	0	0	0	0	31
Tacoma	0		0	0	5	2	0	1	0	4	28
Oregon											
Portland	1	1	1	2	3	17	1	2	2	3	69
Salem	0	1	0	0	0	0	0	0	0	5	0
California											
Los Angeles	23	27	2	5	15	58	0	16	6	39	326
Sacramento	0	1	0	2	5	3	0	4	0	1	40
San Francisco	1	4	1	4	6	7	0	4	1	31	158

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Rhode Island				District of Columbia			
Providence	1	0	0	Washington	1	0	0
New York				West Virginia			
New York	2	2	2	Wheeling	0	1	1
Pennsylvania				North Carolina			
Pittsburgh	1	0	1	Winston-Salem	0	1	0
Ohio				Georgia			
Cleveland	1	1	0	Atlanta	1	0	0
Indiana				Montana			
Indianapolis	1	0	1	Missoula	1	1	0
Illinois				Utah			
Chicago	4	1	0	Salt Lake City	1	0	0
Michigan				Washington			
Detroit	2	0	0	Seattle	0		1
Minnesota				California			
Minneapolis	1	0	0	Los Angeles	2	0	2
Missouri							
Kansas City	1	1	0				

Lethargic encephalitis —Cases New York, 1, Detroit, 1, Minneapolis, 1, Kansas City, Mo , 1; St Louis, 2; Houston, Tex , 1.

Typhus fever —Cases Charleston, S C., 1; Atlanta, 1, Mobile, 2, San Antonio, Tex ,1.

Pellagra.—Cases: Savannah, 1.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—Two weeks ended December 16, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended December 16, 1933, as follows

Disease	Cases	Disease	Cases
Chicken pox	397	Poliomyelitis	8
Diphtheria	61	Puerperal septicemia	2
Erysipelas	5	Scarlet fever	302
German measles	4	Tuberculosis	80
Influenza	19	Typhoid fever	26
Measles	52	Undulant fever	1
Ophthalmia neonatorum	1	Whooping cough	273

CUBA

Habana—Communicable diseases—Four weeks ended December 2, 1933 —During the 4 weeks ended December 2, 1933, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Chicken pox	1		Scarlet fever	2	
Diphtheria	17	2	Tuberculosis	35	3
Malaria	170	2	Typhoid fever	21	4
Measles	24				

ITALY

Communicable diseases—Four weeks ended June 25, 1933.—During the 4 weeks ended June 25, 1933, cases of certain communicable diseases were reported in Italy as follows:

Disease	May 29–June 4		June 5–11		June 12–18		June 19–25	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	16	13	19	17	20	18	22	19
Cerebrospinal meningitis	8	8	16	15	9	8	12	12
Chicken pox	465	157	337	137	426	171	337	140
Diphtheria and croup	539	280	398	223	366	200	367	191
Dysentery	6	6	8	6	6	5	7	7
Lethargic encephalitis	4	4	2	2	4	4	1	1
Measles	2,505	317	1,931	289	1,554	274	1,330	262
Poliomyelitis	10	10	11	11	6	6	7	6
Scarlet fever	516	188	434	146	443	160	407	162
Typhoid fever	352	200	333	202	274	170	313	186

POLAND

Communicable diseases—1928–30.—Cases of certain communicable diseases, with deaths, as reported in Poland during the years 1928, 1929, and 1930, are shown in the following table:

Disease	1928		1929		1930	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Anthrax	81	11	58	6	60	8
Diphtheria	10,460	863	11,977	733	17,074	963
Dysentery	1,784	206	2,750	197	1,910	306
Erysipelas	4,564	207	4,328	222	5,090	245
Leprosy	1				1	
Lethargic encephalitis	38	19	25	8	21	5
Malaria	745	3	315	1	199	1
Measles	37,063	493	25,481	249	59,567	584
Meningitis	715	223	869	259	607	176
Puerperal septicemia	1,189	438	1,309	365	1,564	350
Scarlet fever	28,898	2,159	20,909	1,164	29,991	1,135
Smallpox	21	2	12	1	21	
Trachoma	13,941		14,028		24,689	
Trichinosis	83	2	118		67	1
Typhoid fever	14,080	1,169	15,429	1,052	11,962	910
Typhus fever	2,401	161	1,988	146	1,640	112
Whooping cough	11,865	666	9,082	488	10,206	458

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Dec 29, 1933, pp 1571–1583 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Jan 26, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands —During the week ended December 23, 1933, cholera was reported in the Phillipine Islands, as follows· Bohol Province—Loon, 4 cases, 4 deaths; Tubigon, 7 cases, 6 deaths. Cebu Province—Argao, 1 case, 1 death; Carcar, 5 cases, 2 deaths. Oriental Negros Province—Tanjay, 1 case, 1 death.

Plague

China—Manchuria.—A report dated November 13, 1933, states that plague had been reported in certain provinces of Manchuria, as follows·

Place	Cases	Deaths	Place	Cases	Deaths
Fengtien Province			Jehol Province		
Tunghao hsien	188	179	Erhtaokou	80	80
Kaitung hsien	29	29	Kailu hsien	1	1
Chanyu hsien	23	23	Kirin Province		
Taonan hsien	9	9	Changling hsien	31	25
Hsingan Province—Kaolipan	200	200	Fuju hsien	4	4
			Nungan hsien	444	444

Hawaii Territory—Hamakua District—Paauilo—On December 11, 1933, 2 plague-infected rats were reported in Paauilo, Hamakua District, island of Hawaii

India—Calcutta—On December 14, 1933, 1 case of plague with 1 death was reported in Calcutta, India

Yellow Fever

Brazil—Ceara State—St. Matthew—On August 13, 1933, 1 case of yellow fever with 1 death was reported in St Matthew, Ceara State, Brazil

French West Africa—Togo—On December 14, 1933, 1 case of yellow fever was reported in Togo, French West Africa

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 2

JANUARY 12 - - - 1934

IN THIS ISSUE

Sickness Among Industrial Employees, Third Quarter, 1933
Strain of Animal and Resistance to Transplantable Tumors
Mortality Statistics for Death Registration Area, 1932
Deaths in Large Cities During the Week Ended December 23
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON 1934

For sale by the Superintendent of Documents, Washington, D C - - - - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93, title 44, section 220

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world, (2) articles relating to the cause, prevention, and control of disease, (3) other pertinent information regarding sanitation and the conservation of the public health

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CONTENTS

Page

Sickness among male industrial employees during the third quarter of 1933 — 53

Mortality statistics for the death registration area of continental United States, 1930, 1931, and 1932 — 55

The use of pure-strain animals in studies on resistance to transplantable tumors — 60

Court decision relating to public health — 65

Deaths during week ended December 23, 1933

- Deaths and death rates for a group of large cities in the United States — 66
- Death claims reported by insurance companies — 66

PREVALENCE OF DISEASE

United States

- Current weekly State reports
  - Reports for weeks ended December 30, 1933, and December 31, 1932 — 67
- Summary of monthly reports from States — 69
- Weekly reports from cities
  - City reports for week ended December 23, 1933 — 71

Foreign and insular

- Great Britain—England and Wales—Vital statistics—July–September 1933 — 74
- Italy—Communicable diseases—4 weeks ended July 23, 1933 — 74
- Yugoslavia—Communicable diseases—November 1933 — 75
- Cholera, plague, smallpox, typhus fever, and yellow fever:
  - Cholera — 75
  - Plague — 75
  - Typhus fever — 75

PUBLIC HEALTH REPORTS

VOL. 49 JANUARY 12, 1934 NO. 2

SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE THIRD QUARTER OF 1933[1]

By DEAN K BRUNDAGE, *Statistician, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

The reports of industrial sick-benefit associations to the Public Health Service show a lower rate of cases of sickness causing disability for 8 consecutive days or longer per 1,000 men during July, August, and September 1933 than in the corresponding quarter of any of the 4 preceding years. The rate was 65 3 cases per 1,000 men per year, as compared with 77 0 in the third quarter of 1932 and 88.8 in the corresponding quarter of 1929. For 1932 and 1933, employees of the same companies are compared, and in the earlier years the companies are almost the same There will probably be a few delayed reports of cases having their onset in the recent quarter; but after allowing for some increase in the rates on this account, it appears that a substantial decrease in the frequency of claims for sickness benefits has occurred in this sample of the industrial population

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the third quarter of 1933 compared with the same quarter of 4 preceding years (male morbidity experience of 33 industrial companies which reported their cases to the United States Public Health Service)*[1]

Diseases and disease groups which caused disability (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929)	Annual number of disabilities per 1,000 men in third quarter of—				
	1933	1932	1931	1930	1929
Sickness and nonindustrial injuries [2]	65 3	77 0	81 2	78 0	88 8
Nonindustrial accidents	11 3	13 7	14 5	12 5	13 6
Sickness [2]	54.0	63 3	66 7	65 5	75 2
Respiratory diseases	13 7	16 5	17 1	18 0	24 0
Influenza and grippe (11)	4 2	4.9	4 4	4 4	6 7
Bronchitis, acute and chronic (106)	2 3	2.3	2 6	2 8	3 6
Pneumonia, all forms (107–109)	8	9	7	1 2	1 5
Diseases of the pharynx and tonsils (115a)	2 5	3 5	4 2	4 8	6.0
Tuberculosis of the respiratory system (23)	9	1.2	1 1	9	1 3
Other respiratory diseases (104, 105, 110–114)	3 0	3 7	4 1	3 9	4.9

[1] In 1932 and 1933 the same companies are included. The rates for 1931, 1930, and 1929 cover 33, 26, and 23 companies respectively, instead of 33 in 1932 and 1933

[2] Exclusive of disability from venereal diseases

[1] The report for the second quarter was published in the Public Health Reports of September 29, 1933.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the third quarter of 1933 compared with the same quarter of 4 preceding years (male morbidity experience of 33 industrial companies which reported their cases to the United States Public Health Service)*—Continued

Diseases and disease groups which caused disability (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929)	Annual number of disabilities per 1,000 men in third quarter of—				
	1933	1932	1931	1930	1929
Nonrespiratory diseases	40.3	46.8	49.6	47.5	51.2
Diseases of the stomach, cancer excepted (117, 118)	3.3	4.0	5.0	4.8	4.7
Diarrhea and enteritis (120)	1.3	1.5	2.0	1.9	2.3
Appendicitis (121)	3.6	3.4	3.4	3.7	4.8
Hernia (122a)	1.2	2.3	2.0	1.5	1.8
Other digestive diseases (115b, 116, 122b-129)	2.8	3.0	3.2	2.9	3.7
Rheumatic group, total	8.2	8.8	10.0	10.0	10.3
Rheumatism, acute and chronic (56, 57)	3.5	3.9	4.3	4.5	4.6
Diseases of organs of locomotion (156b)	2.6	2.9	3.2	3.1	3.5
Neuralgia, neuritis, sciatica (87a)	2.1	2.0	2.5	2.4	2.2
Neurasthenia and the like (part of 87b)	.8	1.4	1.6	1.2	1.4
Other diseases of the nervous system (78-85, part of 87b)	1.4	1.6	1.1	1.2	1.3
Diseases of the heart and arteries and nephritis (90-99, 102, 130-132)	2.6	4.1	3.1	2.8	3.5
Other genito-urinary diseases (133-138)	2.3	2.4	2.6	2.3	2.1
Diseases of the skin (151-153)	3.5	3.4	3.8	4.1	4.6
Epidemic and endemic diseases, except influenza (1-10, 12-18, 33, 37, 38, part of 39 and 44)	1.5	1.3	1.4	1.4	1.2
Ill-defined and unknown causes (200)	2.8	2.4	3.0	2.3	1.9
All other diseases (19-22, 24-32, 36, part of 39 and 44, 40-43, 45-55, 58-77, 88, 89, 100, 101, 103, 154-156a, 157, 162)	5.0	7.2	7.4	7.1	7.6
Average number of males covered in the record	138,560	125,619	162,716	100,115	163,851
Number of companies included	33	33	33	26	23

Both respiratory and nonrespiratory diseases contributed to the indicated decrease in sickness incidence in the third quarter of 1933 as compared with the same period of 1932 and with the still higher rates of 1929, although the larger decrease has occurred in the respiratory group. The minor respiratory diseases, especially diseases of the pharynx and tonsils, show a large percentage decrease, but the more serious respiratory diseases such as pneumonia (all forms) and tuberculosis of the lungs were found also at incidence levels below those of 1929.

In the nonrespiratory disease group the "minor" digestive diseases, which include diseases of the stomach and diarrhea and enteritis, showed for the recent quarter a lower rate than in any of the preceding periods under review. The more serious diseases of the digestive system, however, decreased in frequency to a lesser extent. Diseases of the heart and arteries, the genito-urinary diseases, and certain diseases of the nervous system continue at about the same rates as those occurring in the corresponding months of 1929.

As pointed out in previous communications, the sickness rates presented above apply to men employed either on a full- or on a part-time basis, but not to men who have been unemployed for any appreciable period. The reporting companies employ men in all parts of the country, but most of the men are located in the North Central and North Atlantic States.

MORTALITY STATISTICS FOR THE DEATH REGISTRATION AREA OF CONTINENTAL UNITED STATES, 1930, 1931, AND 1932

According to figures furnished by the Bureau of the Census, the death rate for 1932 was the lowest for the United States since the annual collection of mortality statistics was begun in 1900 In the death registration area of continental United States (exclusive of the State of Utah) there were 1,304,109 deaths from all causes in 1932, representing a mortality rate of 10 9 per 1,000 estimated population It is estimated that 96 3 percent of the total population of the United States was included in the registration area for the year 1932 Because of the failure of the State of Utah to furnish the Bureau of the Census with death certificates for the year 1932, no data for that State are included in the summary. However, even if the number of deaths which occurred in Utah were included, the total death rate for each of the three years would remain practically unchanged.

The table compiled by the Bureau of the Census gives the number of deaths and the death rates in each year from 1930 to 1932, inclusive, for each cause, according to the titles of the International List of Causes of Death. This is the first time that the Bureau has released a summary in such detail prior to the publication of the annual report. Some of the detailed causes are omitted in the table published here.

It is gratifying to note that of the 18 groups of causes of death into which the table is divided, 13 showed decreases in the total number of deaths, while only three groups had increases, and two remained practically the same. The groups which show decreases include infectious and parasitic diseases, chronic poisonings and intoxications, diseases of the nervous system, of the respiratory system, of the digestive system, and of pregnancy, childbirth, and the puerperal state Of particular interest is the decrease in certain causes of death such as typhoid fever, measles, diphtheria, tuberculosis, malaria, and diarrhea and enteritis under two years of age. The large decrease of over 9,000 deaths from tuberculosis (all forms), and the drop in the death rate from 71.7 in 1930 to 63 in 1932 is most noteworthy. The smaller number of deaths from diseases of the respiratory system may be accounted for largely by the decrease in both broncho pneumonia and lobar pneumonia. Influenza showed a decided increase, though the rate of increase for 1932 over 1931 was much less than from 1930 to 1931. The decrease in diseases of pregnancy, childbirth, and the puerperal state was approximately the same from 1931 to 1932 as from 1930 to 1931, and is due in a

large measure to the lesser number of deaths from puerperal albuminuria and eclampsia, and puerperal septicemia

The smaller number of violent and accidental deaths is due, principally, to the decreased number of deaths from motor vehicles The number of suicides increased for the 3-year period, and the number of homicides was more for 1932 than for 1930, though less than in the year 1931

The outstanding groups in which large increases were shown were cancers and other malignant tumors and diseases of the circulatory system The number of deaths due to cancer and other malignant tumors continues to increase from year to year, and practically every title to which deaths due to this cause are allocated shows an increase in number if not in actual rates Of the total number of deaths assigned to this title, 25,802 were of the stomach and duodenum, 14,871 of the uterus, 11,863 of the breast, and 10,420 of the liver and biliary passages.

Deaths due to diseases of the circulatory system increased numerically from 280,403 in 1930 to 294,596 in 1932, equivalent to death rates of 237 5 and 246 2, respectively. This large increase was due, principally, to diseases of the myocardium and of the coronary arteries, angina pectoris; chronic endocarditis and other valvular diseases constitute the only cause in this group for which there was a considerable decrease in 1932 from 1930.

Deaths and death rates in the registration area in continental United States (exclusive of Utah)

Cause of death	Number of deaths			Rate per 100,000 estimated population		
	1932	1931	1930	1932	1931	1930
Total deaths (all causes)	1,304,109	1,318,109	1,338,292	1,090 0	1,108.5	1,133 6
I Infectious and parasitic diseases	156,492	162,764	161,740	130 8	136 9	137 0
Typhoid fever	4,356	5,283	5,599	3 6	4 4	4.7
Paratyphoid fever	78	84	87	0 1	0 1	0 1
Typhus fever	36	27	33	(1)	(1)	(1)
Undulant fever	62	66	53	0 1	0 1	(1)
Smallpox	38	95	165	(1)	0 1	0.1
Measles	1,940	3,575	3,795	1 6	3 0	3.2
Scarlet fever	2,560	2,639	2,265	2.1	2 2	1.9
Whooping-cough	5,359	4,591	5,641	4 5	3 9	4 8
Diphtheria	5,409	5,723	5,806	4.5	4 8	4 9
Influenza	36,818	31,596	22,953	30.8	26 6	19 4
Respiratory complications specified	23,954	20,126	13,666	20 0	16.9	11 6
Respiratory complications not specified	12,864	11,470	9,287	10 8	9 6	7 9
Dysentery	2,078	2,437	3,347	1 7	2 0	2 8
Erysipelas	1,917	2,257	2,497	1 6	1.9	2 1
Acute poliomyelitis, acute polioencephalitis	824	2,090	1,369	0 7	1 8	1 2
Lethargic or epidemic encephalitis	867	968	1,053	0.7	0 8	0 9
Epidemic cerebrospinal meningitis	1,655	2,781	4,082	1 4	2 3	3 5
Anthrax (bacillus anthracis) malignant pustule	12	12	15	(1)	(1)	(1)
Rabies	55	55	60	(1)	(1)	0.1
Tetanus	1.118	1.113	1 286	0 9	0 9	1 1

[1] Less than 1 tenth of 1 per 100,000 population.

Deaths and death rates in the registration area in continental United States (exclusive of Utah)—Continued

Cause of death	Number of deaths			Rate per 100,000 estimated population		
	1932	1931	1930	1932	1931	1930
Tuberculosis (all forms)	75,398	81,280	84,595	63.0	68.4	71.7
Respiratory system	67,698	72,413	75,007	56.6	60.9	63.5
Meninges and central nervous system	2,315	2,706	2,987	1.9	2.3	2.5
Disseminated tuberculosis	1,357	1,600	1,630	1.1	1.3	1.4
Other forms of tuberculosis	4,028	4,561	4,971	3.4	3.8	4.2
Leprosy	25	22	27	(1)	(1)	(1)
Syphilis	10,664	10,581	10,541	8.9	8.9	8.9
Gonococcus infection and other venereal diseases	915	1,126	1,083	0.8	0.9	0.9
Purulent infection, septicemia (nonpuerperal)	865	905	1,075	0.7	0.8	0.9
Malaria	2,567	2,536	3,403	2.1	2.1	2.9
Other diseases due to protozoal parasites	52	73	43	(1)	0.1	(1)
Other infectious and parasitic diseases	824	849	867	0.7	0.7	0.8
II. Cancers and other tumors	128,181	123,657	120,537	107.1	104.0	102.1
Cancer and other malignant tumors	122,339	117,790	114,873	102.2	99.1	97.3
Of the buccal cavity and pharynx	4,587	4,559	4,548	3.8	3.8	3.9
Pharynx	917	1,002	1,011	0.8	0.8	0.9
Of the digestive tract and peritoneum	60,607	58,595	57,642	50.7	49.3	48.8
Esophagus	2,058	2,036	1,893	1.7	1.7	1.6
Stomach and duodenum	25,802	25,306	25,313	21.6	21.3	21.4
Intestines (except duodenum, rectum, anus)	12,100	11,459	10,967	10.1	9.6	9.3
Rectum and anus	5,882	5,441	5,191	4.9	4.6	4.4
Liver and biliary passages	10,420	10,259	10,360	8.7	8.6	8.8
Pancreas	3,361	3,121	2,961	2.8	2.6	2.5
Others under this title	981	973	957	0.9	0.9	0.9
Of the respiratory system	4,533	4,022	3,835	3.8	3.4	3.2
Of the uterus	14,871	14,433	14,074	12.4	12.1	11.9
Of other female genital organs	2,677	2,557	2,281	2.2	2.2	1.9
Of the breast	11,863	11,415	10,875	9.9	9.6	9.2
Of the male genitourinary organs	9,546	9,151	8,616	8.0	7.7	7.3
Of the skin	3,120	2,978	3,007	2.6	2.5	2.5
Of other or unspecified organs	10,535	10,080	9,995	8.8	8.5	8.5
Nonmalignant tumors	3,889	3,825	3,718	3.3	3.2	3.1
Tumors of which the nature is not specified	1,953	2,042	1,946	1.6	1.7	1.6
III. Rheumatic diseases, nutritional diseases, diseases of the endocrine glands, and other general diseases	40,856	40,457	41,059	34.1	34.0	34.8
Rheumatism, osteoarthritis, and gout	4,082	4,105	4,468	3.5	3.5	3.8
Diabetes mellitus	26,298	24,236	22,456	22.0	20.4	19.0
Scurvy	32	38	42	(1)	(1)	(1)
Beriberi	5	3	1	(1)	(1)	(1)
Pellagra	3,694	5,090	6,332	3.1	4.3	5.4
Rickets	354	453	537	0.3	0.4	0.5
Osteomalacia	13	22	11	(1)	(1)	(1)
Diseases of the pituitary body	59	42	59	(1)	(1)	(1)
Diseases of thyroid and parathyroid glands	4,316	4,419	4,751	3.6	3.7	4.0
Simple goiter	290	299	316	0.2	0.3	0.3
Exophthalmic goiter	3,642	3,764	3,960	3.0	3.2	3.4
Others under this title	384	356	475	0.3	0.3	0.4
Diseases of the thymus gland and adrenals	1,582	1,570	1,835	1.3	1.3	1.6
Other general diseases	421	479	567	0.4	0.4	0.5
IV. Diseases of the blood and blood-making organs	9,833	9,631	9,184	8.2	8.1	7.8
Hemorrhagic conditions	785	911	692	0.7	0.8	0.6
Anemias	4,376	4,178	4,388	3.7	3.5	3.7
Pernicious anemia	3,878	3,718	3,885	3.2	3.1	3.3
Other anemias	498	460	503	0.4	0.4	0.4
Leukemias and pseudoleukemias	4,131	3,991	3,741	3.5	3.4	3.2
Other diseases of blood and blood-making organs	541	551	363	0.5	0.5	0.4
V. Chronic poisonings and intoxications	3,296	4,232	4,428	2.8	3.6	3.8
Alcoholism (acute or chronic)	3,045	3,926	4,148	2.5	3.3	3.5
Chronic poisoning by other organic substances	146	155	152	0.1	0.1	0.1

[1] Less than one tenth of 1 per 100,000 population

Deaths and death rates in the registration area in continental United States (exclusive of Utah)—Continued

Cause of death	Number of deaths			Rate per 100,000 estimated population		
	1932	1931	1930	1932	1931	1930
Chronic poisoning by mineral substances	105	151	128	0.1	0.1	0.1
VI Diseases of the nervous system and of the organs of special sense	129,297	129,586	132,435	108.1	109.0	112.2
Encephalitis (nonepidemic)	1,288	1,411	1,381	1.1	1.2	1.2
Meningitis (simple and nonepidemic)	2,335	2,775	3,039	2.0	2.3	2.6
Progressive locomotor ataxia (tabes dorsalis)	1,187	1,197	1,302	1.0	1.0	1.1
Other diseases of the spinal cord	3,016	3,272	3,271	2.5	2.8	2.8
Cerebral hemorrhage, embolism, and thrombosis, softening, and other	104,636	103,140	105,013	87.5	86.7	89.0
General paralysis of the insane	4,561	4,657	4,802	3.8	3.9	4.1
Dementia praecox and other psychoses	1,333	1,506	1,621	1.1	1.3	1.4
Epilepsy	2,827	2,957	3,074	2.4	2.5	2.6
Convulsions (under 5 years of age)	840	927	1,158	0.7	0.8	1.0
Other diseases of the nervous system	3,356	3,540	3,727	2.8	3.0	3.2
Diseases of the organs of vision	77	92	98	0.1	0.1	0.1
Diseases of the ear and mastoid process	3,841	4,112	3,916	3.2	3.5	3.3
VII Diseases of the circulatory system	294,596	280,422	280,403	246.2	235.8	237.5
Pericarditis	905	970	1,037	0.8	0.8	0.9
Acute endocarditis	3,544	3,663	3,893	3.0	3.1	3.3
Chronic endocarditis, valvular diseases	61,114	62,251	66,233	51.1	52.4	56.1
Diseases of the myocardium	125,134	117,551	115,401	104.6	98.9	97.8
Diseases of coronary arteries, angina pectoris	37,231	31,985	28,504	31.1	26.9	24.1
Other diseases of the heart	39,908	36,769	37,093	33.4	30.9	31.4
Aneurysm (except of heart)	2,174	2,038	2,111	1.8	1.7	1.8
Arteriosclerosis (coronary arteries excepted)	20,504	21,007	21,835	17.1	17.7	18.5
Gangrene	920	1,004	1,092	0.8	0.8	0.9
Other diseases of the circulatory system	3,162	3,184	3,111	2.6	2.8	2.6
VIII Diseases of the respiratory system	105,555	110,617	112,716	88.2	93.0	95.5
Diseases of the nasal fossae and annexae	1,070	1,182	1,072	0.9	1.0	0.9
Diseases of the larynx	481	454	473	0.4	0.4	0.4
Bronchitis	4,327	4,570	4,978	3.6	3.8	4.2
Bronchopneumonia (including capillary bronchitis)	39,015	39,977	40,449	32.6	33.6	34.3
Lobar pneumonia	49,376	52,950	53,589	41.3	44.5	45.4
Pneumonia, unspecified	3,755	3,756	4,167	3.1	3.2	3.5
Pleurisy	2,617	2,733	2,676	2.2	2.3	2.3
Congestion, edema, embolism, hemorrhagic infarct, thrombosis of lungs	1,790	1,783	1,931	1.5	1.5	1.6
Asthma	1,796	1,865	1,949	1.5	1.6	1.7
Pulmonary emphysema	111	111	153	0.1	0.1	0.1
Other diseases of the respiratory system (tuberculosis excepted)	1,202	1,233	1,279	1.0	1.0	1.1
IX. Diseases of the digestive system	86,910	94,871	101,330	72.6	79.8	85.8
Diseases of buccal cavity and annexa and of pharynx, tonsils	5,165	5,689	5,634	4.3	4.8	4.8
Diseases of esophagus	140	144	154	0.1	0.1	0.1
Ulcer of stomach and duodenum	7,157	7,215	7,310	6.0	6.1	6.2
Other diseases of stomach (cancer excepted)	3,662	3,906	4,522	3.1	3.3	3.8
Diarrhea and enteritis (under 2 years of age)	14,353	18,667	23,243	12.0	15.7	19.7
Diarrhea and enteritis (2 years and over)	5,230	5,997	7,877	4.4	5.0	6.7
Appendicitis	16,978	17,977	17,978	14.2	15.1	15.2
Hernia, intestinal obstruction	12,196	12,484	12,123	10.2	10.5	10.3
Other diseases of intestines	1,181	1,234	1,257	1.0	1.0	1.1
Cirrhosis of liver	8,663	8,822	8,567	7.2	7.4	7.3
Specified as alcoholic	480	510	568	0.4	0.4	0.5
Not specified as alcoholic	8,183	8,312	7,999	6.8	7.0	6.8
Other diseases of liver (including yellow atrophy of liver)	1,614	1,660	1,820	1.3	1.4	1.5

Deaths and death rates in the registration area in continental United States (exclusive of Utah)—Continued

Cause of death	Number of deaths			Rate per 100,000 estimated population		
	1932	1931	1930	1932	1931	1930
Biliary calculi	4,563	4,736	4,570	3.8	4.0	3.9
Other diseases of gall-bladder, biliary passages	3,839	4,068	3,920	3.2	3.4	3.3
Diseases of pancreas	677	674	668	0.6	0.6	0.6
Peritonitis, cause not specified	1,501	1,598	1,678	1.3	1.3	1.4
X. Diseases of the genitourinary system	120,307	119,618	123,232	100.6	100.6	104.1
Nephritis	104,488	103,810	107,274	87.3	87.3	90.9
Other diseases of kidneys and ureters (puerperal diseases excepted)	3,373	3,361	3,491	2.8	2.8	3.0
Other diseases of the genitourinary system	12,446	12,447	12,467	10.3	10.4	10.6
XI. Diseases of pregnancy, childbirth, and the puerperal state	13,241	14,188	15,101	11.1	11.9	12.8
Abortion with septic conditions	2,017	2,100	2,000	1.7	1.8	1.7
Abortion without mention of septic conditions (to include hemorrhages)	713	663	681	0.6	0.6	0.6
Ectopic gestation	570	593	600	0.5	0.5	0.5
Other accidents of pregnancy (not to include hemorrhages)	85	91	171	0.1	0.1	0.1
Puerperal hemorrhage	1,387	1,458	1,540	1.2	1.2	1.3
Puerperal septicemia (not specified as due to abortion)	2,767	3,218	3,420	2.3	2.7	2.9
Puerperal albuminuria and eclampsia	2,680	3,058	3,642	2.2	2.6	3.1
Other and unspecified conditions of puerperal state	2,902	3,007	3,047	2.4	2.5	2.5
XII. Diseases of the skin and cellular tissue	1,892	2,147	2,114	1.6	1.8	1.8
XIII. Diseases of the bones and organs of locomotion	1,598	1,562	1,549	1.3	1.3	1.3
Osteomyelitis	1,063	1,054	1,044	0.9	0.9	0.9
Other diseases of the bones and organs of locomotion	535	508	505	0.4	0.4	0.5
XIV. Congenital malformations	12,315	13,030	13,201	10.3	11.0	11.2
XV. Diseases of early infancy	51,308	54,002	58,657	42.9	45.4	49.7
XVI. Senility	10,145	10,375	11,700	8.5	8.7	9.9
XVII. Violent and accidental deaths	117,370	124,543	124,146	98.1	104.7	105.2
Suicide	20,880	20,030	18,496	17.5	16.8	15.7
Homicide	11,016	11,134	10,590	9.2	9.4	9.0
Accidental, other, or undefined	85,474	93,379	95,060	71.4	78.5	80.5
XVIII. Ill-defined causes of death	20,908	22,407	24,760	17.5	18.8	21.0

THE USE OF PURE STRAIN ANIMALS IN STUDIES ON RESISTANCE TO TRANSPLANTABLE TUMORS

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Growth of transplantable tumors is known to be influenced by individual variations in natural resistance on the part of the inoculated animals Furthermore, it is agreed that this natural resistance is hereditary Such knowledge has led experienced investigators (1) to advise the use of pure strain animals in investigations with propagable tumors. Indeed, a group of investigators has come to believe that the study of transplantable tumors lies entirely within the field of genetic factors The reader is referred to a publication by Bittner (2), in which he has reviewed the literature pertaining to this phase of the problem

Also, it is agreed that individual variations in animals influence the development of concomitant immunity following inoculation of certain propagable tumors Russell (3) recognized this factor during his studies on acquired resistance While his investigations with mouse adenocarcinoma 63 led him to conclude that "its power of inducing resistance is nil", he also observed that "in the extreme cases of strain 63, resistance is induced occasionally in a certain number of animals " He attributed such variations in the ability to resist reinoculation as "the expression of slight differences in the constitution of the animals "

In a previous publication (4) it was noted that the factor of individual variation plays an important role in the ability of mice to build up resistance to sarcoma 180. In addition, it was found that caudal growth of sarcoma 180 in a pure strain of mice failed to induce concomitant immunity to the same extent as in "market" mice. This finding emphasized the importance of strain variation as well as individual variation in the ability of mice to become immune to a transplantable tumor. The present paper deals with results attending the continuation of experiments in which pure strain mice were used for the study of resistance to transplantable growths.

EXPERIMENTAL ANIMALS

All the mice were obtained from the stocks maintained at the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. A brief description of each strain is presented below·

Strain A.—Inbred since 1918 by Dr. L. C. Strong. These animals descended from a stock of albino mice which Dr. H. J. Bagg started to inbreed in 1912 Breeding females are highly susceptible to the development of spontaneous tumors.

Strain D—Inbred since 1909 This strain was started by Dr. C. C. Little At present the inbreeding is carried on by Dr. W S Murray. The strain is of dilute brown color A high percentage of breeding females develop spontaneous tumors

Strain C_3H.—Inbred since 1921 by Dr. L. C Strong Color of wild house mice High incidence of tumor in breeding females

Strain CBA—Inbred since 1921 by Dr L C Strong Color of wild house mice There is no record of spontaneous tumor in any mouse of the last 10 generations Both the C_3H and CBA strains are descended from an out-cross between the strain D and strain A mice described above

Strain C57.—Inbred since 1921 The strain, started by Dr C C Little, was taken over by Dr. J. M Murray in 1925 The mice are of brown color and develop spontaneous tumors at an advanced age.

In these experiments only female mice of strain A, strain C_3H, and strain CBA were used, while all mice of strain D and strain C57 were males

TUMOR STRAINS

Three well-known transplantable mouse tumors were used Adenocarcinoma 63 was utilized because of Russell's (3) earlier experiments on its properties of inducing resistance Sarcoma 180 is characterized by its ability to proliferate in practically all strains of mice Recent investigations (4) have demonstrated its power of eliciting a high degree of concomitant immunity Another sarcoma (sarcoma 37) is known as a rapidly growing tumor (5) which also induces a high degree of resistance

EXPERIMENTAL OBSERVATIONS

Previous experience (6) had shown that the growth of both sarcoma 180 and sarcoma 37 within the tails of mice elicited resistance. Consequently, the same procedure was followed in the present experiments. Pieces of tumor, free from necrotic material, were passed through a mincing machine and the resultant mash was inoculated caudally by means of a 1-cc syringe and an 18-gage needle. Both sarcomas grew in the tails of all strains of mice Two weeks after caudal inoculation, the animals were etherized and their tails amputated. In order to test for the presence of immunity, a piece of actively growing tumor was implanted in the subcutaneous tissue of the groin. Any mouse negative to the first test was reinoculated in the opposite groin. Only those mice showing complete resistance to the tumor by remaining tumor-free after all groin implantations were called immune. In fact, all the animals immune to either sarcoma 180 or sarcoma 37 received at least three test implantations of tumors which gave

practically 100 percent of takes in normal control mice of the same strain.

The results of efforts to induce immunity to sarcoma 180 and sarcoma 37 are summarized in table 1

TABLE 1.—*The immunological response of pure strain mice to sarcoma 180 and sarcoma 37*

Mouse strain	Sarcoma 180				Sarcoma 37			
	Number of experiments	Number of mice tested	Immune		Number of experiments	Number of mice tested	Immune	
			Number	Percent			Number	Percent
A	5	76	24	32	8	161	136	84
C_3H	7	156	16	10	6	64	32	50
D	3	39	0	0	2	54	0	0
CBA	6	64	41	64	5	47	37	79
C57	3	65	4	6	3	52	37	71

It is seen that so far as the animals of strains A, C_3H, and C57 are concerned, sarcoma 37 possesses the power of inducing resistance to a far greater degree than does sarcoma 180. Both tumors are capable of producing a high degree of immunity in mice of strain CBA. It may be significant that strain CBA mice, which do not have spontaneous tumors, were found to be immunized by sarcoma 180, while the other strains, all of which develop spontaneous growths, were found to be susceptible to the immunity tests. This finding is in accordance with previous observations (4), in which it was found that sarcoma 180 failed to induce immunity in another strain having a high rate of spontaneous tumors to the same extent as "market" mice. The inability of either tumor to elicit resistance in mice of strain D will be discussed later.

ATTEMPTS TO INDUCE RESISTANCE TO ADENOCARCINOMA 63

Russell (3), using but one strain of mice, found carcinoma 63 incapable of producing immunity to reinoculation. More recently, however, Bullock and Rohdenburg (7) and Foulds (8) have found that substrains of the tumor were able to render animals immune. In the present experiments caudal inoculation of carcinoma 63 as a method of producing immune mice proved to be impractical because the tumor was unable to grow within the mouse's tail. However, it was noted that the tumor, when implanted within the subcutaneous tissue of the groin, grew much more slowly than either of the sarcomas, and, in addition, regressed in a considerable number of inoculated animals. Hence, the ability of carcinoma 63 to produce immunity in mice was determined by an initial groin inoculation and subsequent reinoculations in the opposite groin and one axilla. This procedure

is best explained by presenting the protocol of one experiment along these lines

Experiment I —February 2, 1933 Forty-six mice of strain A, 32 mice of strain C_3H, and 15 mice of strain C57 were inoculated in the right groin with carcinoma 63. The results were as follows

Strain A 31 positive and 15 negative
Strain C_3H 29 positive and 3 negative
Strain C57 7 positive and 8 negative

On March 7, all mice positive to the first inoculation were reinoculated in the left groin with carcinoma 63, along with normal controls of each strain On March 14 the test animals were inoculated in the left axilla, along with additional normal controls The results in the mice surviving 4 weeks after the last immunity test were as follows

Strain A 25 immune and 2 not immune Controls 32 positive and 8 negative
Strain C_3H 14 immune and 11 not immune Controls 24 positive and 4 negative
Strain C57 5 immune and 2 not immune Controls 10 positive and 5 negative

Attention is directed to the procedure of using only those mice growing the initial implantation for the subsequent immunity tests. The results of all attempts to grow carcinoma 63 in the groin of mice and the findings in respect to its ability to elicit resistance are presented in table 2

TABLE 2 —*The response of pure strain mice to inoculation and reinoculation of carcinoma 63*

Strain	Results of initial inoculation				Results of immunity tests		
	Number of experiments	Number of mice inoculated	Positive		Number of mice tested	Immune	
			Number of mice	Percent		Number of mice	Percent
A	4	86	63	73	58	47	81
C_3H	3	56	48	86	41	22	54
D	4	52	52	100	52	0	0
C57	2	25	11	44	11	7	64

COMMENTS

The observations recorded in this paper show that the genetic constitution of the inoculated animal has a pronounced influence upon the development of resistance to sarcoma 180, sarcoma 37, and carcinoma 63 This factor was recognized by Russell (3) in his classical studies on tumor resistance; but in his opinion "its powers are weaker than those of the tumor." The results of these experiments place the inoculated animal on a par with the tumor as a factor in induced resistance. Carcinoma 63 did not possess the power to immunize mice of strain D, but a primary growth of the same tumor immunized

81 percent of mice belonging to strain A and 54 percent of mice of strain C_3H Any variation in the activity of the tumor itself can be excluded from these results, since in practically all the experiments the same tumor material was used for the inoculation of all strains of mice

The findings in respect to both sarcoma 180 and sarcoma 37 afford further evidence of the importance of the constitution of the inoculated animal in their immunological reaction to transplantable growths. Sarcoma 180 elicited resistance in 64 percent of strain CBA mice, but failed to immunize a single individual belonging to strain D. The growth of sarcoma 37 immunized 84 and 79 percent of strain A and strain CBA mice respectively, but was unable to produce immunity in any animal of strain D.

None of the tumors employed in these experiments possessed the power to induce immunity in strain D mice Indeed, the reaction of mice of this strain to inoculation and reinoculation is of considerable interest Experience in this laboratory has shown that they excel as a medium for the propagation of transplantable tumors. This finding is not in harmony with the earlier work of Haaland (9), who claimed that strains of mice showing a high incidence of spontaneous tumors were not superior to other mice for the implantation of transplantable tumors Subsequent reinoculation of strain D animals with any tumor strain maintained in this laboratory has shown that their ability to build up resistance is nil. In this respect they resemble animals bearing spontaneous tumors, since it has been shown (9) that the growth of a spontaneous tumor does not immunize the animal against an autograft of its own spontaneous tumor.

It has also been observed that while transplantable tumors grow luxuriantly within the tissues of strain D mice, they have a definite effect upon the tumor itself by diminishing its growth energy when implanted back into other mice. This is particularly true for carcinoma 63. This tumor grows progressively in every mouse of strain D and can be carried through an unlimited number of passages. However, after the tumor has undergone several passages through strain D animals, it grows with the greatest difficulty in other mice. In this laboratory carcinoma 63 grows progressively in about 70 percent of "market" mice, but several passages through strain D mice lower its growth energy to such an extent that it proliferates in only about 5 percent of "market" animals. This problem is receiving further attention.

CONCLUSION

Three tumor strains and four strains of pure-strain mice have been employed in a study on resistance to transplantable tumors. The

results attending these experiments show that the genetic constitution of the inoculated animals of these strains is an important factor in the development of resistance to reinoculation of the three tumors

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(7) Bullock, F D , and Rohdenburg, G L Jour Cancer Res , **5** (1920), p. 129.
(8) Foulds, L , Ninth Sci Report, Imperial Cancer Research Fund, London, 1930, p 93
(9) Haaland, M , Fourth Sci Report, Imperial Cancer Research Fund, London, 1911, 1

COURT DECISION RELATING TO PUBLIC HEALTH

City held not liable for injuries received by workman while working for city in sewer pipe —(Texas Court of Civil Appeals; *Ballard et ux.* v. *City of Fort Worth*, 62 S W (2d) 594; decided May 20, 1933.) An action was brought against the city of Fort Worth to recover damages for injuries alleged to have been received by the plaintiff as a result of asphyxiation by noxious gases while at work for the city in one of the pipes of the city's sewer lines The city's principal defense was that, in the establishment and operation of its sewer system, it performed a governmental function and hence was not liable for the negligence of its officers and employees. The court of civil appeals said that the established facts were that the city constructed and maintained its sewer system, for purposes specified in the charter, from its general revenue and without fees charged or profit No material distinction could be seen by the court between the instant case and a prior case, decided by the State supreme court, wherein it was said:

It is well settled by the decisions of this court as well as by those in other jurisdictions that sanitation for the public health of a city is a governmental function and that, when a city is exercising such power, it is not liable for injuries inflicted through the negligence of its officers and employees * * *

A judgment in favor of the city was affirmed, the court saying:

If the rule of exemption under consideration is broad enough to include a mere chemical substance used in connection with the operation of a sewer for sanitary purposes, no sound reason exists for holding that the sewer system itself is beyond its scope.

DEATHS DURING WEEK ENDED DECEMBER 23, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec 23, 1933	Corresponding week, 1932
Data from 85 large cities of the United States		
Total deaths	8,652	9,611
Deaths per 1,000 population, annual basis	12 1	13 7
Deaths under 1 year of age	563	696
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	49	56
Deaths per 1,000 population, annual basis, first 51 weeks of year	10 9	11 2
Data from industrial insurance companies		
Policies in force	67,291,366	69,276,593
Number of death claims	13,664	13,977
Death claims per 1,000 policies in force, annual rate	10 6	10.5
Death claims per 1,000 policies, first 51 weeks of year, annual rate	9 8	9 5

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Dec. 30, 1933, and Dec. 31, 1932

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec 30, 1933, and Dec 31, 1932

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec 31, 1932
New England States								
Maine				72			0	0
New Hampshire					105	1	0	0
Vermont		1			40	1	0	0
Massachusetts	18	29		51	567	97	0	1
Rhode Island	3	1		48	2	1	0	0
Connecticut	7	6	23	96	3	27	0	0
Middle Atlantic States								
New York	52	66	[1] 14	[1] 649	437	789	0	3
New Jersey	30	21	18	164	129	255	0	3
Pennsylvania	56	105			509	297	5	3
East North Central States								
Ohio	101	72	84	1,178	156	419	1	1
Indiana	39	68	63	1,899	108	14	0	3
Illinois	53	68	27	363	53	43	7	21
Michigan	11	40		167	16	314	2	3
Wisconsin	5	8	30	1,906	168	215	1	1
West North Central States								
Minnesota	6	3	2	55	14	52	0	1
Iowa [2]	13	12	3	3,436	51	3	1	1
Missouri	45	36	10	257	158	23	0	4
North Dakota	4	2		4,618	62	26	1	1
South Dakota	7	3		199	197	3	0	0
Nebraska	13	11		365	8	6	0	2
Kansas	31	17		27,779	24	17	0	1
South Atlantic States								
Delaware	3	4	2	9	13	2	0	0
Maryland [2, 3]	15	11	30	1,390	18	8	1	1
District of Columbia	9	10	1	74	48	4	0	1
Virginia	55	26			109	113	1	0
West Virginia	32	13	60	1,911	18	109	3	0
North Carolina	34	29	18	804	706	85	1	1
South Carolina	7	5	288	2,179	75	35	0	0
Georgia [3]	9	8		1,467	291	3	2	7
Florida	11	14	4	70	27		0	0
East South Central States								
Kentucky	20	21	12	3,064	23		0	0
Tennessee	26	19	53	4,098	148	14	0	3
Alabama [3]	30	24	17	4,424	64		1	0
Mississippi [2, 3]	9	7					1	0

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec 30, 1933, and Dec 31, 1932—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec 31, 1932
West South Central States								
Arkansas	19	12	44	10,054	63		0	4
Louisiana	49	17	1	910		11	0	2
Oklahoma [4]	35	36	109	2,369	91	3	0	0
Texas [3]	198	70	138	2,794	174	450	0	0
Mountain States								
Montana	2	1	7	7,073	3	256	0	0
Idaho		3		12	1	1	0	1
Wyoming				181	107	11	0	0
Colorado	3	5		109	5	7	0	0
New Mexico	6	24	1	1	31	2	0	1
Arizona	4	1	40	32	4	1	0	1
Utah [2]		2		44	429	1	0	0
Pacific States								
Washington	3	3	3	154	201	2	0	1
Oregon	7	1	46	2,358	10	15	0	0
California	13	44	10	1,219	326	83	3	5
Total	1,093	980	1,158	90,102	5,861	3,849	31	77

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec. 31, 1932
New England States:								
Maine	0	0	6	21	0	0	3	2
New Hampshire	0	0	8	20	0	0	0	0
Vermont	0	0	19	11	0	0	0	0
Massachusetts	0	0	179	353	0	0	4	3
Rhode Island	0	0	10	36	0	0	1	0
Connecticut	0	0	48	110	0	6	1	0
Middle Atlantic States								
New York	2	6	420	554	0	0	0	2
New Jersey	1	4	135	241	0	0	4	1
Pennsylvania	1	2	480	621	0	0	16	9
East North Central States:								
Ohio	4	1	517	615	0	8	4	6
Indiana	0	0	167	111	0	4	5	0
Illinois	3	2	481	374	0	0	25	9
Michigan	0	1	124	463	1	0	7	16
Wisconsin	2	0	154	65	35	5	0	0
West North Central States.								
Minnesota	1	2	46	83	2	0	2	0
Iowa [2]	0	2	65	42	7	34	0	0
Missouri	0	0	77	74	5	0	5	1
North Dakota	0	0	18	6	0	1	0	0
South Dakota	0	0	5	15	0	0	0	3
Nebraska	2	0	35	36	6	1	1	1
Kansas	0	0	94	87	1	0	2	0
South Atlantic States								
Delaware	0	0	7	6	0	0	0	1
Maryland [2 3]	0	0	61	94	0	0	4	4
District of Columbia	0	0	19	9	0	0	2	0
Virginia	1	1	95	66	0	4	7	7
West Virginia	1	0	73	37	4	1	1	1
North Carolina	1	0	63	60	1	1	1	3
South Carolina	2	1	6	12	0	1	1	3
Georgia [3]	1	1	8	12	0	0	8	5
Florida	0	1	1	8	0	0	4	1
East South Central States:								
Kentucky	0	1	21	49	0	1	8	2
Tennessee	0	2	72	72	5	5	3	2
Alabama [3]	0	0	25	27	1	0	9	0
Mississippi [2 3]	1	0	17	17	0	0	1	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Dec 30, 1933, and Dec 31, 1932—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec 31, 1932	Week ended Dec 30, 1933	Week ended Dec 31, 1932
West South Central States								
Arkansas	0	0	14	9	4	0	1	1
Louisiana	1	1	29	9	0	9	3	8
Oklahoma [4]	0	0	53	39	1	10	3	2
Texas [3]	0	0	110	69	13	15	20	0
Mountain States								
Montana	0	0	11	12	0	0	2	3
Idaho	0	1	6	3	2	5	0	1
Wyoming	0	0	15	4	0	0	0	0
Colorado	0	0	11	42	9	0	1	2
New Mexico	0	0	5	19	0	0	9	4
Arizona	1	0	16	8	0	0	2	0
Utah [2]	0	0	17	9	13	0	0	0
Pacific States								
Washington	2	1	26	21	5	6	0	0
Oregon	0	0	38	22	5	2	6	1
California	2	0	129	108	5	7	8	5
Total	29	30	4,036	4,781	125	126	188	112

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended Dec 30, 1933, 16 cases, as follows Maryland, 1, Georgia, 4, Alabama, 7; Mississippi, 1, Texas, 3
[4] Exclusive of Oklahoma City and Tulsa

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
1933										
South Dakota										
July	2	5	2		28		3	20	0	5
August	1	7	7	1	3		6	13	0	24
September	1	9	3	2	9		8	34	1	16
October	1	15	5		109		12	75	2	16
November	4	16	2		620		5	74	3	11
October 1933										
Colorado	2	42	3		14		2	116	26	33
Indiana	8	335	163		28		5	548	3	54
Nevada		3	2		1		0	3	0	1
November 1933										
California	13	236	283	11	805	2	25	1,079	42	135
Georgia	7	224	214	340	497	18	10	80	1	50
Kansas	3	135	1	1	27		3	586	4	14
Montana	1	16	48		9		3	56	0	11
Nevada		3	3		1		0	10	1	0
Oregon		12	74	1	45		6	206	12	16
Puerto Rico		77	223	5,623	99		0		0	19
Washington	6	19	46		395		11	166	13	35

South Dakota, 1933

	Cases
Chicken pox	
July	3
August	5
September	10
October	106
November	165
Impetigo contagiosa	
September	4
Lethargic encephalitis	
August	1
September	2
October	4
Mumps	
July	1
August	9
September	5
October	28
November	34
Rocky Mountain spotted fever	
July	2
Septic sore throat	
August	1
September	2
Tetanus	
August	1
September	1
Trichinosis	
August	1
Undulant fever	
July	1
September	1
November	1
Whooping cough	
July	30
August	33
September	57
October	24
November	36

October 1933

Chicken pox	
Colorado	141
Indiana	178
Lethargic encephalitis	
Colorado	1
Indiana	4
Nevada	1
Impetigo contagiosa	
Colorado	19
Mumps	
Colorado	34
Indiana	3
Paratyphoid fever	
Colorado	3
Rabies in animals	
Indiana	30
Undulant fever	
Indiana	1
Vincent's infection	
Colorado	2
Whooping cough	
Colorado	145
Indiana	62

November 1933

	Cases
Actinomycosis	
California	2
Botulism	
California	1
Chicken pox	
California	1,622
Georgia	49
Kansas	594
Montana	372
Nevada	6
Oregon	150
Puerto Rico	14
Washington	435
Dysentery	
California, (amoebic)	54
California (bacillary)	65
Georgia	15
Kansas (amoebic)	1
Montana (amoebic)	2
Oregon	2
Puerto Rico	154
Washington	3
Favus	
Montana	1
Filariasis	
Puerto Rico	8
Food poisoning	
California	81
German measles	
California	43
Kansas	19
Washington	5
Granuloma, coccidioidal	
California	2
Hookworm disease	
California	1
Georgia	339
Impetigo contagiosa	
Kansas	8
Montana	20
Oregon	69
Washington	4
Jaundice, epidemic	
California	2
Leprosy	
California	3
Puerto Rico	1
Lethargic encephalitis	
California	1
Kansas	4
Oregon	1
Washington	2
Mumps	
California	1,480
Georgia	110
Kansas	91
Montana	10
Oregon	3
Puerto Rico	51
Washington	228

	Cases
Ophthalmia neonatorum	
California	3
Puerto Rico	7
Washington	1
Paratyphoid fever	
California	2
Georgia	2
Kansas	2
Puerto Rico	4
Puerperal septicemia	
Puerto Rico	8
Washington	1
Rabies in animals	
California	116
Oregon	1
Washington	15
Scabies	
Kansas	2
Montana	32
Oregon	51
Septic sore throat	
California	6
Georgia	20
Kansas	1
Montana	8
Oregon	3
Washington	2
Tetanus	
California	5
Georgia	1
Kansas	5
Puerto Rico	16
Tetanus, infantile	
Puerto Rico	10
Trachoma	
California	18
Georgia	1
Montana	1
Puerto Rico	57
Trichinosis	
California	7
Tularaemia	
Kansas	3
Montana	2
Typhus fever	
Georgia	72
Undulant fever:	
California	13
Georgia	1
Kansas	2
Vincent's infection	
Kansas	7
Montana	3
Oregon	10
Whooping cough:	
California	1,303
Georgia	172
Kansas	290
Montana	23
Nevada	2
Oregon	51
Puerto Rico	213
Washington	228
Yaws:	
Puerto Rico	3

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec 23, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Maine											
Portland	0		0	0	1	2	0	0	0	5	27
New Hampshire											
Concord	0		1	0	0	2	0	0	0	0	10
Nashua	0		0	0	0	5	0	0	0	6	
Vermont											
Barre	0		0	24	1	0	0	1	0	0	4
Burlington	0		0	0	0	4	0	0	0	0	7
Massachusetts											
Boston	2		2	167	29	38	0	14	0	43	263
Fall River	1		0	0	6	5	0	2	1	1	35
Springfield	0		0	0	1	0	0	0	0	10	22
Worcester	1		0	269	4	9	0	2	0	14	57
Rhode Island											
Pawtucket	0		0	0	0	0	0	0	0	0	13
Providence	2		1	0	13	7	0	1	1	1	72
Connecticut											
Bridgeport	0	3	1	2	1	13	0	1	0	1	34
Hartford	2		0	0	0	9	0	1	0	1	44
New Haven	0		0	0	4	1	0	1	0	3	42
New York											
Buffalo	0		2	65	18	14	0	5	0	14	141
New York	33	9	10	40	178	166	0	87	5	105	1,567
Rochester	0		0	0	6	10	0	2	0	4	63
Syracuse	0		0	0	4	8	0	1	0	26	50
New Jersey											
Camden	4		0	2	1	7	0	1	0	0	35
Newark	1		2	2	7	8	0	7	0	18	104
Trenton	1	2	0	0	9	16	0	1	0	1	42
Pennsylvania											
Philadelphia	0	12	8	173	69	67	0	25	1	24	543
Pittsburgh	8	3	2	3	29	32	0	10	0	33	196
Reading	1		2	3	4	5	0	0	0	2	41
Scranton	0		0	0	0	2	0	0	0	1	
Ohio											
Cincinnati											
Cleveland	6	26	3	7	25	45	0	14	1	50	203
Columbus	1	4	4	1	7	32	0	2	0	0	81
Toledo	0	2	2	68	3	36	0	3	0	4	66
Indiana											
Fort Wayne	3		0	0	3	3	0	1	0	0	30
Indianapolis	2		1	4	9	15	0	6	0	15	
South Bend	0		0	0	3	10	0	1	0	0	15
Terre Haute	0		0	16	6	1	0	1	0	1	25
Illinois											
Chicago	1	5	1	7	75	172	0	30	1	92	727
Springfield											
Michigan:											
Detroit	9	6	2	6	29	96	0	17	1	64	242
Flint	0		0	3	3	20	0	2	0	1	18
Grand Rapids	0		0	1	2	3	0	0	0	2	31
Wisconsin											
Kenosha	0		0	0	0	18	0	0	0	6	10
Milwaukee	4	4	4	3	8	12	0	8	0	47	103
Racine	0		0	1	0	15	0	1	0	6	19
Superior	0		0	0	1	0	0	0	0	0	9
Minnesota											
Duluth	0		1	0	3	2	0	2	0	0	23
Minneapolis	1		1	0	11	9	0	1	0	3	113
St Paul	1		0	1	6	10	0	3	1	9	64
Iowa											
Des Moines	2			0		17	0		0	0	40
Sioux City	0			2		1	0		0	2	
Waterloo	0			3		0	0		0	2	
Missouri											
Kansas City	3		2	1	12	32	0	6	0	5	95
St Joseph	3		0	1	3	1	0	0	0	0	23
St Louis	0	2		106	14	15	0	13	3	18	233
North Dakota											
Fargo	0		0	33	0	2	0	0	0	0	4
Grand Forks	0		0	0	0	0	0	0	0	0	
South Dakota.											
Aberdeen	0		0	0	0	0	0	0	0	0	
Nebraska											
Omaha	3		0	5	8	11	1	3	0	3	45

City reports for week ended Dec 23, 1933—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
Kansas											
Topeka	0	---	0	0	1	3	0	1	0	2	18
Wichita	1	---	0	0	1	4	0	1	0	0	28
Delaware											
Wilmington	0	---	0	1	5	2	0	0	0	3	29
Maryland											
Baltimore	8	15	3	4	31	28	0	10	1	52	228
Cumberland	2	---	0	0	2	3	0	0	0	0	14
Frederick	0	---	0	0	0	5	0	0	0	0	4
District of Columbia											
Washington	15	4	3	15	21	17	0	12	3	12	185
Virginia											
Lynchburg	2	---	0	0	3	1	0	0	0	0	13
Norfolk	0	---	0	1	0	9	0	0	0	1	32
Richmond	4	---	1	2	5	8	0	1	1	1	54
Roanoke	1	---	0	0	1	7	0	0	0	0	14
West Virginia											
Charleston	3	1	0	1	2	2	0	1	0	0	9
Huntington	0	---	0	1	0	11	0	0	0	0	---
Wheeling	0	---	0	0	1	6	0	0	0	0	14
North Carolina											
Raleigh	0	---	0	0	1	2	0	0	1	1	8
Wilmington	1	---	0	0	2	0	0	0	0	0	9
Winston-Salem	3	1	1	152	1	4	0	0	0	0	19
South Carolina											
Charleston	3	11	0	0	1	0	0	1	0	0	17
Columbia	---	---	---	---	---	---	---	---	---	---	---
Greenville	0	---	0	0	0	3	0	0	0	0	6
Georgia											
Atlanta	12	17	1	9	8	3	0	1	0	2	61
Brunswick	0	---	0	0	0	0	0	0	0	0	5
Savannah	2	18	1	11	4	1	0	0	0	1	34
Florida											
Miami	1	---	0	0	1	3	0	0	1	1	24
Tampa	2	1	1	0	0	0	0	1	1	0	23
Kentucky											
Ashland	2	---	---	0	---	1	0	---	0	0	---
Lexington	3	---	0	1	2	2	0	3	0	0	20
Louisville	7	---	0	0	12	22	0	7	0	4	130
Tennessee											
Memphis	6	---	0	13	13	14	0	7	0	9	96
Nashville	7	---	1	32	4	6	0	1	0	2	36
Alabama											
Birmingham	5	---	4	0	4	4	0	3	0	0	56
Mobile	0	---	0	3	0	1	0	1	0	0	22
Montgomery	2	---	---	2	---	4	0	---	0	0	---
Arkansas											
Fort Smith	1	---	---	0	---	1	0	---	0	0	---
Little Rock	0	---	0	10	3	0	0	3	0	0	6
Louisiana											
New Orleans	10	1	3	1	6	7	0	10	1	1	141
Shreveport	1	---	0	0	2	2	0	1	0	0	26
Texas											
Dallas	16	---	0	0	4	3	0	2	2	0	45
Fort Worth	10	---	0	0	5	7	0	1	0	0	31
Galveston	0	---	0	0	1	1	0	0	0	0	9
Houston	10	---	1	0	4	3	1	3	0	0	71
San Antonio	2	---	3	0	7	5	0	6	1	0	75
Montana											
Billings	0	---	0	0	0	1	0	0	0	0	10
Great Falls	0	---	0	0	0	1	0	0	0	1	5
Helena	0	---	0	0	0	0	0	0	0	0	4
Missoula	0	---	0	0	0	0	0	0	1	0	5
Idaho											
Boise	0	---	0	1	2	0	1	0	0	1	12
Colorado											
Denver	0	37	1	3	7	13	1	3	0	36	80
Pueblo	0	---	1	2	0	1	0	0	0	3	8
New Mexico											
Albuquerque	0	---	0	0	0	3	0	3	2	5	14
Utah											
Salt Lake City	0	---	0	258	6	14	0	1	0	11	41
Nevada											
Reno	0	---	0	0	0	0	0	0	0	0	[illegible]

City reports for week ended Dec 23, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Washington											
Seattle	0	-------	1	1	14	9	0	8	2	37	109
Spokane	0	1	1	200	2	1	0	1	0	2	19
Tacoma	0	-------	0	0	2	3	0	0	0	3	24
Oregon											
Portland	0	-------	0	1	8	11	5	2	0	2	76
Salem	0	1	0	0	0	0	0	0	0	0	--------
California											
Los Angeles	19	17	1	6	26	51	0	22	10	29	308
Sacramento	0	-------	0	6	0	1	0	3	1	0	26
San Francisco	0	6	2	5	13	10	0	12	1	13	182

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts				Michigan			
Boston	0	1	0	Detroit	0	2	0
New York				Missouri			
New York	2	0	1	St Joseph	1	0	0
Pennsylvania				District of Columbia			
Pittsburgh	0	0	1	Washington	2	0	1
Ohio				Kentucky			
Cleveland	1	0	0	Lexington	1	0	0
Indiana				California			
Indianapolis	1	1	0	Los Angeles	0	1	1
Illinois							
Chicago	2	0	1				

Pellagra —Cases Philadelphia, 1, Chicago, 1, Charleston, S C , 2, Atlanta, 1, Savannah, 1
Lethargic encephalitis —Cases St Louis, 2, Fargo, 1
Typhus fever —Cases Savannah, 1, Montgomery, 2

FOREIGN AND INSULAR

GREAT BRITAIN

England and Wales Vital statistics—July September 1933.—During the third quarter of the year 1933, 148,085 live births and 95,842 deaths were registered in England and Wales The following statistics are taken from the Quarterly Return of Births, Deaths, and Marriages, issued by the Registrar-General of England and Wales The figures are provisional

Birth and death rates in England and Wales, July–September, 1933

Annual rates per 1,000 population	
Live births	14 60
Stillbirths	58
Deaths, all causes	9 50
Deaths from	
Diphtheria	05
Influenza	04
Measles	02
Scarlet fever	01
Annual rates per 1,000 population—Continued	
Deaths from—Continued	
Typhoid fever and paratyphoid fever	0 01
Violence	58
Whooping cough	04
Deaths per 1,000 live births	
Diarrhea and enteritis (under 2 years)	9 10
Total deaths under 1 year	49 00

England and Wales—Infectious diseases—Thirteen weeks ended October 1, 1933.—During the 13 weeks ended October 1, 1933, cases of certain infectious diseases were reported in England and Wales, as follows.

Disease	Cases	Disease	Cases
Diphtheria	11,085	Puerperal pyrexia	1,416
Ophthalmia neonatorum	1,090	Scarlet fever	29,281
Pneumonia	6,284	Smallpox	90
Puerperal fever	539	Typhoid fever	753

ITALY

Communicable diseases—4 weeks ended July 23, 1933. During the 4 weeks ended July 23, 1933, cases of certain communicable diseases were reported in Italy as follows:

Disease	June 26–July 2		July 3–9		July 10–16		July 17–23	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	18	18	29	27	32	30	40	37
Cerebrospinal meningitis	8	8	10	6	6	4	6	6
Chicken pox	366	145	292	134	257	137	284	145
Diphtheria and croup	378	208	275	155	286	178	294	169
Dysentery	14	10	14	11	22	17	24	19
Lethargic encephalitis	3	3	2	2	2	2		
Measles	1,360	295	1,253	279	1,234	204	1,360	260
Poliomyelitis	8	8	9	9	6	6	19	16
Scarlet fever	338	137	320	132	289	140	296	143
Typhoid fever	346	209	446	261	497	203	617	371

YUGOSLAVIA

Communicable diseases—November 1933—During the month of November 1933, certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	54	8	Poliomyelitis	5	-------
Cerebrospinal meningitis	6	3	Scarlet fever	711	28
Diphtheria and croup	1,274	132	Sepsis	14	6
Dysentery	110	15	Tetanus	39	21
Erysipelas	244	19	Typhoid fever	450	50
Measles	548	4	Typhus fever	13	1
Paratyphoid fever	26	-------			

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Dec. 29, 1933, pp. 1571-1583. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Jan. 26, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands—During the week ended December 30, 1933, cholera was reported in the Philippine Islands as follows: Bohol Province—Calape, 10 cases, 9 deaths; Clarin, 1 case, 1 death; Loon, 10 cases, 10 deaths; Tubigon, 12 cases, 7 deaths. Cebu Province—Argao, 6 cases, 4 deaths; Carcar, 28 cases, 18 deaths; San Fernando, 1 case, 1 death; Sibonga, 8 cases, 8 deaths. Occidental Negros Province—Calatraba, 1 case; San Carlos, 4 cases, 3 deaths.

Plague

Hawaii Territory—Paauilo.—On December 18, 1933, 1 plague-infected rat was reported in Paauilo, Hamakua District, Island of Hawaii.

Union of South Africa—Cape Province—During the week ended November 11, 1933, 6 cases of plague with 4 deaths were reported on the farm Springfield, Cape Province, Union of South Africa. In addition, 2 cases of plague with 1 death occurred in Kabah Location, Uitenhage town, and 2 cases with 1 death at Fonteinshoek, all in Cape Province.

Typhus Fever

Chile.—According to a report dated November 29, 1933, 8,000 cases of typhus fever had been reported in Chile from the beginning

of the epidemic to October 31, 1933 The mortality was about 22 percent Official reports for October 1933 were as follows.

Week ended	Confirmed cases	Suspected cases	Week ended—	Confirmed cases	Suspected cases
Oct 7	547	87	Oct 21	718	8
Oct 14	654	12	Oct 28	681	27

A dangerous focus of the epidemic in Santiago was said to be the so-called "conventillos", or tenement dwellings, housing about 200,000 persons in the city Sanitary brigades visit such of these dwellings as are reported to be infected, disinfecting the rooms and delousing the occupants

In the southern part of the country it was reported that typhus fever had almost disappeared from the larger communities, but that many cases were found in the rural sections where insurmountable difficulties were encountered in combatting the epidemic. Much opposition to cooperation with the health authorities was found among the inhabitants.

Despite the present condition of the epidemic, optimism was felt for the future, there having been a decline, according to latest cases reported, from 2,200 cases on October 15, 1933, to 1,640 cases.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 3

JANUARY 19 - - - 1934

IN THIS ISSUE

Summary of Current Prevalence of Communicable Diseases
The Response of Peritoneal Tissue to Injected Dusts
Use of Sulphur Dioxide for the Fumigation of Vessels
Deaths in Large Cities During Week Ended December 30
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D C - - - - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R. C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93; title 44, section 220

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

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CONTENTS

	Page
Current prevalence of communicable diseases in the United States—Dec. 3-30, 1933	77
The physiological response of the peritoneal tissue to dusts introduced as foreign bodies	80
Sulphur dioxide for the fumigation of ships—Methods of use and prospects for improvement	89
Court decision relating to public health	100
Directory of State health authorities—Illinois—A correction	101
Deaths during week ended Dec 30, 1933	
Deaths and death rates for a group of large cities in the United States	101
Death claims reported by insurance companies	101

PREVALENCE OF DISEASE

United States:	
Current weekly State reports	
Reports for weeks ended Jan 6, 1934, and Jan 7, 1933	102
Summary of monthly reports from States	104
Weekly reports from cities:	
City reports for week ended Dec 30, 1933	105
Foreign and insular	
Canada:	
Provinces—Communicable diseases—2 weeks ended Dec 16, 1933	108
Quebec Province—Communicable diseases—2 weeks ended Dec 30, 1933	108
Cuba—Habana—Communicable diseases—4 weeks ended Dec 31, 1933	108
Czechoslovakia—Communicable diseases—October 1933	109
Cholera, plague, smallpox, typhus fever, and yellow fever:	
Cholera	109
Plague	109
Yellow fever	109

PUBLIC HEALTH REPORTS

VOL. 49 JANUARY 19, 1934 No. 3

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

December 3–30, 1933

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Measles.—Reports indicated an increase in measles slightly above the seasonal expectancy. The number of cases reported for the current 4-week period was 20,496, approximately double the number for the preceding 4 weeks In relation to preceding years, for the country as a whole the current incidence was 1.5 times that for the corresponding period in each of the years 1932 and 1931. For the past 4 years the incidence of measles has been very low; the average for this period for the years 1929 to 1932, inclusive, was approximately 14,000 cases.

A comparison of geographic areas shows that all sections contributed to the current increase, except the East North Central, in which area the number of cases (1,571) was only about 40 percent of last year's figure for this period. The disease appeared to be most prevalent in the South Atlantic, South Central, and Mountain and Pacific areas. In the South Atlantic States the number of cases (4,812) was more than three times that of last year, while in the South Central and Mountain and Pacific areas the numbers (2,462 and 3,182) were more than double those of last year.

Influenza.—The number of cases of influenza reported for the 4 weeks ended December 30 was 4,796, which was approximately 1,200 above the figure for this period in 1931 and only slightly above the reported incidence in 1930, but about two thirds of that in 1929, which was not an epidemic period. Influenza was epidemic in December of 1932, 157,860 cases being reported in this 4-week period of that year. Since February 1933, the influenza incidence has been

[1] From the Office of Statistical Investigations, U S Public Health Service The numbers of States included for the various diseases are as follows Typhoid fever, 48, poliomyelitis, 48, meningococcus meningitis, 48, smallpox, 48; measles, 47, diphtheria, 48, scarlet fever, 48, influenza, 38 States and New York City. The District of Columbia is counted as a State in these reports These summaries include only the eight important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers.

low; no section of the country has reported more than the normal seasonal prevalence

Diphtheria.—Although the usual seasonal decrease of diphtheria was apparent in all parts of the country, the number of cases (5,150) reported for the 4 weeks ended December 30 was 12 percent in excess of that for the corresponding period last year. For this period in 1931, 1930, and 1929 the cases totaled 7,216, 5,950 and 8,154, respectively The disease seemed to be most prevalent in the South Atlantic and South Central areas In the South Atlantic the incidence (1,030 cases) was 1 7 times that of last year—in fact, it was the highest incidence reported in that area for the 5 years for which data are available; in the South Central areas the incidence was 1.6 times that of last year, the West North Central area reported a slight increase over last year. Each of the other areas reported the lowest incidence for this period in 5 years

Meningococcus meningitis.—In relation to previous years the incidence of meningococcus meningitis continued considerably below the level of the preceding 5 years The number of cases reported for the current 4-week period was 172, only about 70 percent of last year's figure. Each geographic area shared in this favorable situation except the South Atlantic, where, since the middle of the current year, the incidence has been considerably higher than last year The 33 cases reported for the current 4-week period was the highest number for this period in that area since 1929 The decreases in other areas ranged from 12 percent in the New England and Middle Atlantic States to 45 percent in the East North Central and South Central areas

Smallpox.—For smallpox, the number of cases (515) reported for the current 4-week period was approximately the same as that reported for the corresponding period last year. For this period in 1931 and 1930 the numbers of cases were 1,238 and 2,172, respectively. A very favorable situation existed in all sections of the country except the East North Central and Mountain regions. Among the East North Central States, Wisconsin reported 165 cases for the current period as against 12 for the same period last year; in the Mountain area, Montana reported 19 as against 2 last year, Colorado 25 as against 2, and Utah 27 as against none. In other areas the incidence continued the lowest in recent years.

Typhoid fever.—For three consecutive 4-week periods the incidence of typhoid fever was higher than for the corresponding period last year. For the 4 weeks ended December 30 the number of cases was 945, as against 680 last year. However, for this period in 1931 and 1930 the numbers of cases were 1,175 and 1,266, respectively. The incidence in the New England, Middle Atlantic, South Atlantic, and East North Central regions closely approximated that of last year;

the West North Central and Mountain and Pacific regions each reported about three times as many cases for the current period as were reported last year; and in the South Central regions the number of cases (282) was twice that of last year.

Scarlet fever.—There were 18,174 cases of scarlet fever reported for the current 4 weeks, as compared with 18,237, 15,660, and 15,638 for the corresponding period in 1932, 1931, and 1930 In the New England and Middle Atlantic States the incidence of the disease continued considerably lower than that for last year, the number of cases (5,356) for the current period being only about 70 percent of last year's figure. All other sections of the country reported increases ranging from 8 percent in the East North Central area to 50 percent in the South Central area For the country as a whole, scarlet fever has maintained a very satisfactory level throughout the entire year.

Poliomyelitis—All sections of the country reported the usual seasonal decline of poliomyelitis during the current 4-week period, but the incidence was still considerably above (1.2 times) the level of last year and also above that of 1929 The incidence for this period in 1932 and 1929 was approximately the same and was relatively low. In 1931 and 1930 the numbers of cases in this period were 266 and 332, respectively. For the first time since the middle of the year the number of cases reported from the New England and Middle Atlantic and the West North Central States was lower than for the corresponding period last year. In the East North Central, South Atlantic, and Pacific areas the numbers of cases were almost double those of last year The incidence in the West North Central and South Central areas was the lowest for this period in the 5 years for which data are available, and in the Mountain area it compared very favorably with recent years.

Poliomyelitis was less prevalent during the first half of the current year than during the first half of any of the last 5 years The epidemic-like incidence which made its appearance in the latter part of July was confined mostly to the New England and Middle Atlantic and the North Central areas, other sections of the country being but slightly affected, if at all.

Mortality, all causes.—The average mortality rate from all causes in large cities, as reported by the Bureau of the Census, showed a seasonal rise from 11 2 per 1,000 population (annual basis) for the preceding 4 weeks to 12.1 for the 4 weeks ended December 30. For this period in the years 1932, 1931, and 1930, the rate was 13.4, 11.4, and 12 3, respectively. The 1932 rate was unduly high because of an influenza epidemic. The rate for the current period falls between the 1931 and the 1930 rates for this period. The rates for the first half of 1933 were uniformly below 1930, 1931, and 1932.

THE PHYSIOLOGICAL RESPONSE OF THE PERITONEAL TISSUE TO DUSTS INTRODUCED AS FOREIGN BODIES [1]

By JOHN W. MILLER, *Acting Assistant Surgeon*, and R R SAYERS, *Surgeon, United States Public Health Service*

The physiological response of the body tissues to dusts of various kinds has been a subject of much interest in the past few years, and the opinion that the injury due to dust is chemical rather than physical in action has recently gained greater ground Mavrogordato, Gardner, Gye, and others have conducted experiments on the action of inhaled dusts Kettle (*1, 2*)[2] has studied the response to dusts injected into the subcutaneous tissues and intratracheally, and Policard (*3, 4*) has used the cornea and conjunctiva in his recent studies In 1924, experiments were begun at the Pittsburgh station of the United States Bureau of Mines to determine the action and fate of various dusts when injected into the peritoneal cavity of guinea pigs (*5*). The conclusions reached at that time were that live animal tissue in all parts of the body tends to react in essentially the same manner to foreign bodies and that fibrous tissue is formed in the peritoneal cavity by quartz and is not formed by limestone and coal. This paper reports a continuation and elaboration of these earlier studies.

Owing to the length of time required to obtain a reaction by inhalation methods and the desirability of determining the harmfulness of a dust in a relatively short time, other methods of introducing the dusts to be studied were considered Injection into the peritoneal cavity seemed to give the most promise, because of the relatively circumscribed area of the cavity, the ease in controlling the amount of the dose, and the preservation of the sterility of the material introduced—a factor to be considered in inhalation and intratracheal methods. Mortality following intraperitoneal injection from peritonitis or peritoneal damage was found to be negligible. Identical reactions were found in each animal injected with the same dust under the same conditions and examined at the samé time interval after injection (Animals in groups of from 5 to 20 were used for each set of test conditions.) Therefore the fact that the reaction to the dust involves both epithelial and connective tissue is of no disadvantage

The reaction is essentially the same microscopically as that produced in the lungs, and the gross appearance of the dust nodules is sufficiently differentiated to afford a means of classifying the physiological response to the dusts. In the series studied here, there were three types of reaction; namely, an absorption or dissolution of the

[1] From the Office of Industrial Hygiene and Sanitation.

[2] Italic figures indicate references cited.

dust, a proliferative reaction, and an inert reaction In the inert reaction the dust neither caused an increase in the size of the nodules nor disappeared from the tissues; instead there was more or less a change in its distribution in the peritoneum. These reactions will be discussed more fully under the different groups of dusts

PREPARATION OF THE DUSTS FOR INJECTION

It was desirable for the particle size of each dust in the series to conform as closely as possible to that of the other dusts used, and also to be as small as possible without a change in the physical or chemical composition Particles passed through 100-, 200-, and 325-mesh standard sieves were used in one series of tests with several dusts. The 325-mesh size was found to be the most suitable, because of the greater facility with which a reaction is produced The particles obtained by passing a dust through a 325-mesh sieve were less than 43 microns in size.

In a later series, a Roller type air separator *(6)* was used. This method of elutriation did not separate all the dusts in the series into fractions of the same size; yet it did produce, with one exception, samples less than 5 microns in maximum measurement. The exception, soapstone, measured 8 microns as a maximum particle size. The median size of the dusts used in this series varied from 0.75 to 1.7 microns, with soapstone at 3.5 microns Such small variations in particle size appeared to be of no importance in comparing the physiological responses produced by the dusts. It can be readily seen that the air-separated particles more closely approximate those inhaled under industrial conditions *(7)* While the smaller particles were preferable, because of their greater assimilation by the cells, the particles that had been passed through a 325-mesh sieve gave the same gross reactions and, in the case of all dusts mentioned in this study, can be used in place of the more difficultly obtained smaller particles. Water separation was not attempted, because of the possibility of removing soluble portions of the dusts and thus producing a change in their chemical composition.

TECHNIQUE OF INTRAPERITONEAL INJECTIONS

A weighed portion of the dust and a few glass beads to facilitate suspension were placed in a small wide mouthed flask and sterilized in a hot-air oven for 1 hour at 150° C. After cooling, sufficient sterile physiological saline solution to make a 10 percent suspension was added, the bottle was closed with a sterile rubber stopper, and the whole was thoroughly shaken. Owing to the fact that a suspension of fine dust causes a locking of the plunger of a hypodermic syringe, air-bulb syringes of 3-cc capacity were used. Any small hypodermic

syringe, fitted with a rubber bulb in place of the plunger, will serve the purpose Needles of 21- or 24-gage were found most suitable for the injections The needles and syringes were sterilized in boiling water before use

The hair on the right side of the animal's abdominal wall was clipped and tincture of iodine was applied For injection, 2 cc of the 10 percent suspension, equivalent to 0 2 g of dust, was introduced, intraperitoneally, into each pig at the iodine-painted site. As the needle was withdrawn, a very small quantity, about 2 drops, was injected into the subcutaneous tissue, to serve as a marker of the site of injection. This marker made it possible to observe whether any trauma was produced by the introduction of the needle into the peritoneal cavity and its effect on the reaction instituted by the dust.

Certain groups of animals were injected with air-separated material and other groups with 325-mesh material. The former were killed and examined 7, 14, 30, 56, and 90 days after injection; the latter at the same intervals and also at 112 days.

DISTRIBUTION OF THE DUST IN THE PERITONEAL CAVITY

With the exception of bituminous coal, the greater part of each of the dusts in this series was found in the peritoneum of the anterior abdominal wall, the most dependent portion of the peritoneal cavity. The site of the next largest collection was the omentum Small nodules and dispersed collections of particles were also found in the inguinal canals, on the mesentery, liver, intestines, testes or uterus, and diaphragm. A very little was occasionally found on the posterior abdominal wall. In the case of bituminous coal, the greater portion was found in the omentum and mesentery, while a relatively small part was present on the anterior abdominal wall. As a basis of comparison (in describing the reactions caused by the dusts), the nodules formed on the anterior abdominal wall were used, since they were more accessible and were more constant and uniform in appearance. The response in the omentum or at any other point in the peritoneal cavity was, however, the same as that found on the anterior abdominal wall. Nodules were only infrequently found in the peritoneum at the site of the entrance of the needle—so rarely, in fact, that it was safe to assume that the trauma produced by the introduction of the needle was negligible.

ADHESIONS IN THE PERITONEAL CAVITY

Adhesions between the various abdominal viscera and the anterior abdominal wall or omentum were at first thought to be of some significance. However, it was noted that while the presence of adhesions was more frequent when dusts of a high silica content were used

and correspondingly less frequent with such dusts as calcite and limestone, they were not of sufficient constancy to be used to draw any definite conclusions as to the activity of the dust. Adhesions were formed occasionally by calcite and by limestones of a very low silica content. They were likewise present to a marked degree in the animals injected with cement, yet subsequent observations showed that these dusts decreased appreciably in amount in the tissues as the tests progressed. It was concluded that the formation of adhesions was a result of the initial foreign body injury caused by the dust in the peritoneal cavity. Various attempts to alleviate this initial stage of irritation were tried without success. It can be readily seen that, while such a simple response as the formation of peritoneal adhesions would be of value in interpreting the activity of the dusts, the occurrence is of such irregularity and the factors involved in their formation depend so much on chance that their presence is of no particular importance.

THE PERITONEAL RESPONSE TO THE VARIOUS DUSTS

Calcite.[3]—Calcite, after being injected into the peritoneal cavity, formed nodules which were irregular, more or less discrete, but often clumped. A small amount of congestion and oedema was noted about the edges of the nodules in the early stages, but this had subsided before the end of 30 days after injection. This congestion and oedema were evidently due to the initial foreign body injury instituted by the dusts. The nodules became progressively smaller in size as the interval between injection and examination increased, and this decrease in size was accompanied by the production of brown pigment particles, which were first noted at the edges of the nodules, and later covered their entire surfaces and diffused into the adjacent peritoneum. The original dust eventually disappeared, leaving a small area of fine, brown pigment particles at the site of the nodule. These, in turn, soon disappeared without the formation of scar tissue. This type of reaction, namely the disappearance of the dust from the peritoneal cavity, has been designated, for the sake of description, as one of absorption.

Limestone.[4]—Limestone caused a reaction similar to that of calcite, one of absorption The rate in which the dust disappeared from the tissues was much slower than in the case of the purer Iceland spar; yet there was such a marked decrease in the amount of dust found in 90 and 112 days after injection that it can be safely assumed that all of the dust will eventually disappear. The initial foreign body

[3] Pure Iceland spar Chemical analysis Calcium carbonate, 99 8, silica, 0 1 percent Median size of the particles, 1 4 microns

[4] A high grade Pennsylvania limestone Chemical analysis Calcium oxide, 54 4, magnesium oxide, 0 4; iron and aluminum oxides, 0.4, silica, 1 5 percent Petrographic examination showed granular, irregularly rounded calcite. Median size of the particles, 1 45 microns.

irritation and the production of the brown pigment and its disappearance from the peritoneum without the formation of scar tissue was identical with the process produced by calcite

Precipitated calcium carbonate.[5]—Precipitated calcium carbonate produced a tissue response very much like that of calcite and limestone The formation of the nodules was identical in character, and the original dust disappeared in about the same length of time as in the case of calcite, yet more brown pigmentation was produced, which lingered in the tissues for a longer time than did that formed by the calcite This increased production of pigment might be attributed to the fact that the dust was in a state more easily assimilated by the cells The pigment particles were much smaller in size and much greater in number than those produced by either calcite or limestone. No evidence of scar tissue formation was noted in any of the animals examined The reaction was clearly one of absorption.

Gypsum.[6]—Gypsum eventually produced a response similar to that of calcite In the early stages the dust appeared to lie inertly in the peritoneum without any appreciable change By the end of 30 days a slight decrease in the amount of dust was noted, and by 90 days this decrease was marked. The color of the nodules became progressively darker as the interval between injection and examination increased, but the production of brown pigment, noted in the other three dusts, was absent Fine, dispersed dust particles, more or less isolated, were noted in the peritoneum. These may have been the remains of nodules or else particles disseminated by phagocytes. The diminution in the size of the nodules and the disappearance of the dust from the tissues were not as rapid as in the case of calcite, limestone, and precipitated calcium carbonate; yet this response was sufficiently marked to designate the reaction as one of absorption.

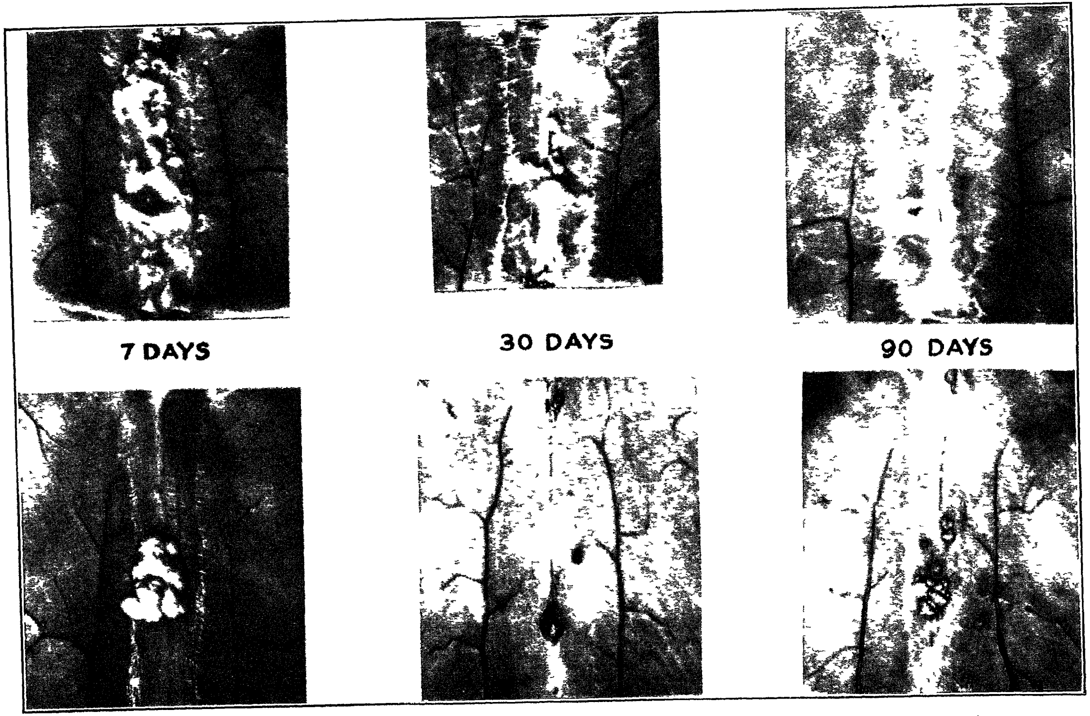
Portland cement.[7]—Portland cement produced a reaction slightly different from that caused by calcite, limestone, precipitated calcium carbonate, and gypsum; yet the ultimate outcome appeared to be one of absorption. The initial foreign-body irritation was quite severe—so marked, in fact, that 16 of 36 guinea pigs injected with this dust died during the tests. This was probably due to the chemical properties of the cement. The animals that survived showed extensive peritoneal congestion and oedema in the early stages. After this reaction had subsided, the dust decreased in quantity, with the formation of a light brown pigment, similar to that produced by calcite,

[5] A chemical by-product Chemical analysis Calcium carbonate, 87 9, magnesium carbonate, 10 0; magnesium oxide, 0 1, iron and aluminum oxides, 0 6; silica, 0 4 percent Median size of the particles, 1.28 microns

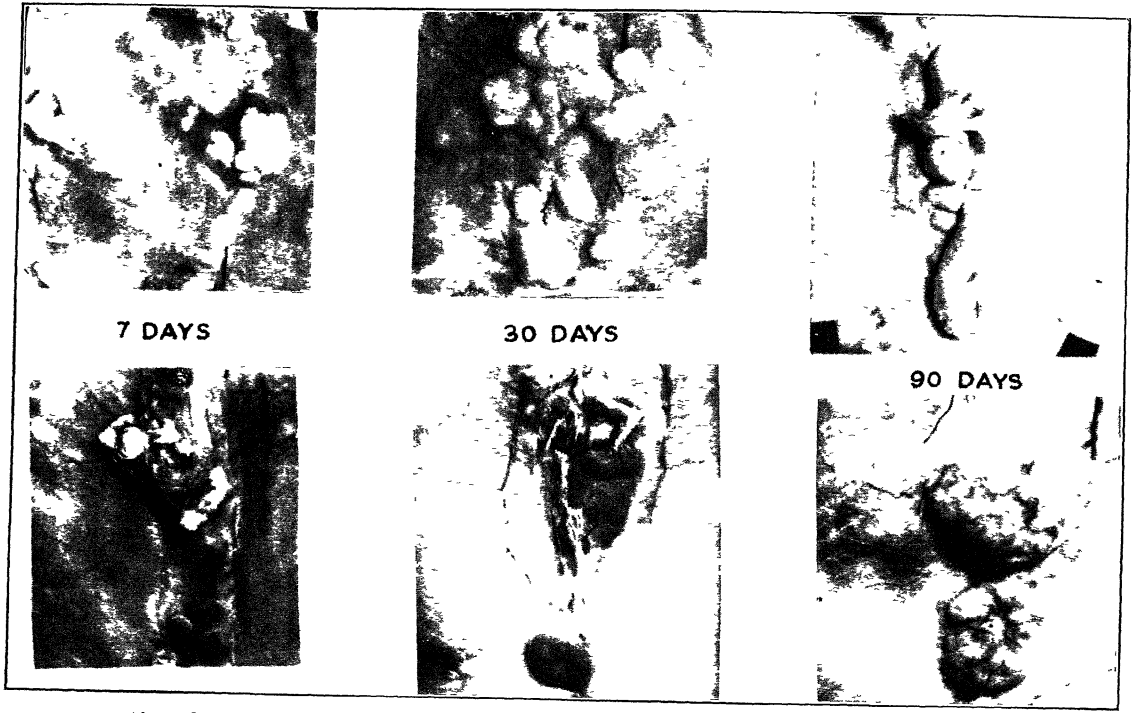
[6] The uncalcined, natural mineral. Petrographic examination showed approximately 30 percent as calcite in the form of rounded granules and irregular rhomboidal crystals and approximately 70 percent as fragmented particles of gypsum. Median size of the particles 1 3 microns

[7] Petrographic examination showed normal portland cement The particles were sharp and angular. Median size of the particles, 1.05 microns.

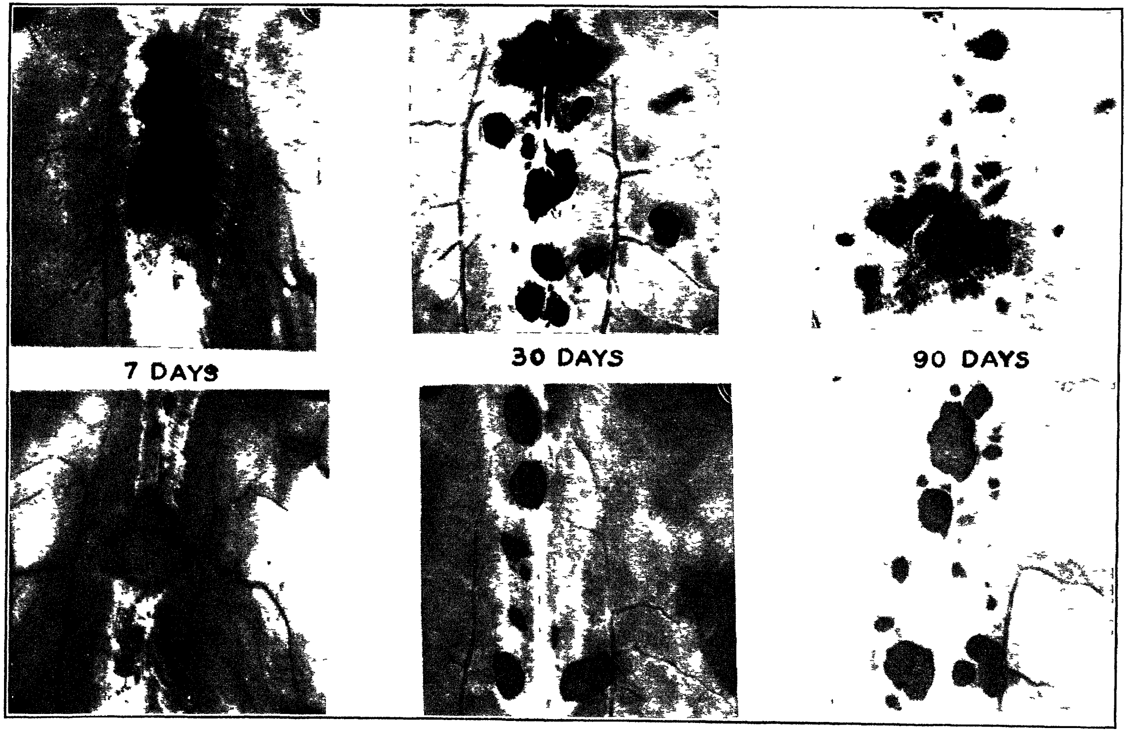
PLATE I



Above, calcite, below, limestone Appearance of nodules on anterior abdominal wall 7, 30, and 90 days after injection

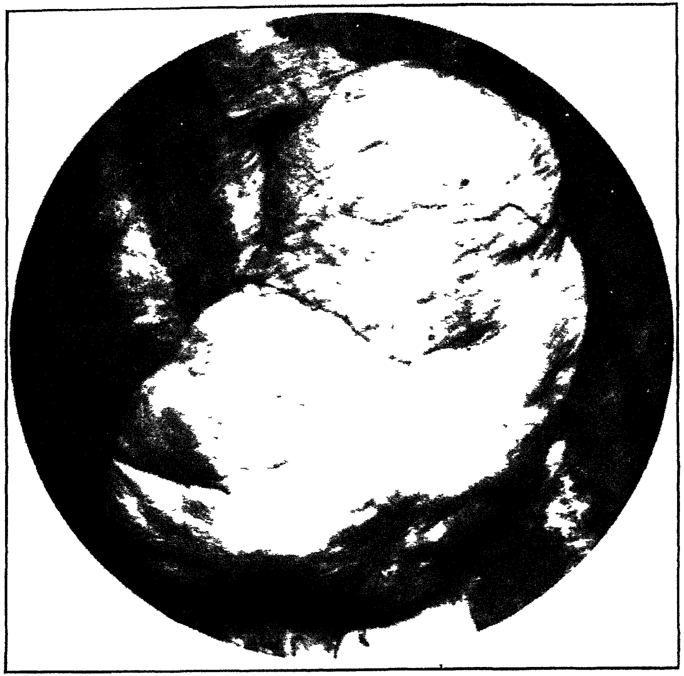


Above, flint below, chat Appearance of nodules on anterior abdominal wall 7, 30, and 90 days after injection



Above, anthracite coal, below, jewelers' rouge Appearance of nodules on anterior abdominal wall 7, 30, and 90 days after injection

PLATE IV



Quartz nodule, 90 days after injection

Calcite, 90 days after injection Note fine, brown pigment granules in the peritoneum These are all that remain of the nodule

limestone, and precipitated calcium carbonate. At the end of 90 days after injection a large amount of this pigment was still present in the peritoneum Experiments to determine whether this pigment will eventually disappear are now in progress.

Quartz[8]—Quartz, after an initial stage of foreign-body irritation, manifested by oedema and congestion about the collections of the dust in the peritoneum, produced nodules which progressively increased in size These nodules, when occurring in clumps, fused together, forming a single large mass Numerous capillaries were present on the surfaces and throughout the nodules The appearance was that of cellular proliferation and was apparently due to the chemical irritation supplied by the solution of the silica in the tissue and presumably will continue as long as any silica remains. Whether these nodules disappear with or without the formation of scar tissue is now being determined, but, inasmuch as the majority of cells found in the tumor masses were macrophages, fibroblasts, and fibrous tissue cells, it seems likely that scar tissue will be the logical result This type of reaction, for convenience of description, will be referred to as one of proliferation.

Chat.[9]—Chat caused a reaction similar to that of quartz though the nodules produced by the action of the dust were much larger in size than those formed by the more pure rock crystal The nodules found 90 and 112 days after injection were markedly larger in size than those noted in 7 days. The color of the nodules, which was the same as that of the dust introduced, remained constant throughout the duration of the tests The reaction produced by chat was decidedly one of tissue proliferation.

Flint.[10]—Flint caused the formation of nodules identical in appearance to those produced by quartz. They were, however, somewhat smaller in size than those produced by chat in the same intervals of time. The response to this dust was clearly one of proliferation.

Soapstone.[11]—Soapstone produced the same type of reaction in the first 2 weeks after injection that was noted in all of the other dusts; namely, an initial foreign body irritation. This early fixation reaction was not severe and subsided quite rapidly. As the time between injection and autopsy increased, the nodules, at first raised and rounded, became flattened and spreading. The edges became irregular, and numerous fine dust particles were noted in the peritoneum

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[8] Ground rock crystal of high purity Chemical analysis showed 99 4 percent silica Petrographic examination showed clear, crystalline, normal quartz Median size of the particles, 1 7 microns

[9] The waste product from the concentration of lead and zinc ores Chemical analysis showed 76 1 percent silica Petrographic examination showed quartz and chert, stained with limonite, predominating About 25 percent of the silica was normal, angular quartz fragments Median size of the particles, 1 22 microns

[10] Finely ground Pennsylvania quartz Chemical analysis showed 99 1 percent silica Petrographic examination showed quartz of high purity Median size of the particles, 1.6 microns

[11] Chemical analysis showed silica, 49 9, calcium oxide, 1 7, and magnesium oxide, 26 2 percent Petrographic examination showed about 30 percent as tremolite, about 65 percent as talc, and about 5 percent as dolomite. Median size of the particles, 3 5 microns.

adjacent to the edges of the nodules Collections of these particles were found at various other points in the peritoneum. The amount of dust in the peritoneal cavity found 90 and 112 days after injection was approximately the same as that noted in 7 days. The injected dust was neither absorbed nor did it institute a cellular proliferation. The only change noted was that of the distribution of the dust in the peritoneum The particles became more wide-spread in their dispersion as the interval between injection and examination increased, and this dissemination was shown microscopically to have been effected by macrophages No appreciable change in the quantity of dust was noted in 112 days after injection, and, inasmuch as no dissolution of the dust or cellular proliferation occurred, this type of reaction, for the sake of description, will be referred to as one of inertness.

Carborundum [12]—Carborundum, or silicon carbide, produced essentially the same type of reaction as soapstone. The initial stage of foreign-body irritation was not as severe, and the distribution of the fine-dust particles in the later stages of the tests was more extensive. Though the nodules became more flattened and spreading, the amount of dust found in the peritoneal cavity 90 days after injection was approximately the same as was noted in 7 days. The material is apparently a nonirritating, insoluble, foreign body and is readily transported throughout the peritoneum by phagocytes As no absorption or cellular proliferation was noted, the reaction can be called one of inertness

Jewelers' rouge.[13]—Jewelers' rouge, or ferric oxide, behaved in the peritoneum in a manner similar to that of soapstone and silicon carbide. The nodules became flattened, and many dust particles were extensively disseminated throughout the peritoneum as the time interval between injection and examination lengthened. The amount of dust observed 90 days after injection was approximately the same as that found in 7 days. The response of the peritoneal tissue to this dust is therefore one of inertness.

Anthracite coal.[14] [15]—Anthracite coal produced a more rapid response following injection than did soapstone, carborundum, or jewelers' rouge. Minute dust particles were noted in the peritoneum adjacent to the nodules as early as 7 days after injection. By 90 days this distribution was quite extensive. The amount of dust present in the

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[12] Pure, manufactured silicon carbide Petrographic examination showed no impurities. Median size of the particles, 1 15 microns

[13] Pure ferric oxide in a finely divided state Petrographic examination showed a high purity hematite as fine, uniform particles. Median size of the particles, 0 95 micron

[14] A Pennsylvania anthracite Petrographic examination showed about 95 percent as coal and 5 percent as inorganic materials. Of the latter, about 60 percent appeared as quartz and about 40 percent as calcite, siderite, and rutile. Median size of the particles, 0 75 micron

[15] A coal similar in petrographic examination to that described in footnote 14 Median size of the particles, 1.11 microns

peritoneal cavity 90 days after injection was approximately the same as that found in 7 days, therefore it was concluded that anthracite coal dust was inert in reaction.

Bituminous coal [16] [17]—Bituminous coal, like soapstone, carborundum, jewelers' rouge, and anthracite coal, appeared to be inert and insoluble in the peritoneum The nodules behaved in a manner similar to those of the above-named dusts, and the dispersion of the dust particles throughout the peritoneum was particularly widespread. With this dust very few nodules were formed on the anterior abdominal wall, the most dependent portion of the animals' peritoneal cavity to which injected material would naturally gravitate; but the majority of the nodules were consistently found in the omentum. Many small nodules and diffuse areas of dust particles were also found in every portion of the peritoneal cavity. The amount of dust present 90 days after injection was approximately the same as that found in 7 days; therefore the reaction was one of inertness.

Precipitator ash.[18]—Precipitator ash, or "fly ash", produced a reaction similar to that of the other inert dusts mentioned in this series. The nodules behaved similarly in their progress to those formed by soapstone Relatively coarse, black particles were noted on the surfaces of the dark gray nodules These were evidently carbon particles, as the dust was of mixed composition The dissemination of the original gray dust composing the bulk of the sample, while not as extensive as that of the coals, was well marked and apparently the same as was found with soapstone and silicon carbide. As there appeared to be no disappearance of this dust from the peritoneal cavity or cellular proliferation, it seems safe to class this dust as inert in type.

SUMMARY

1. A definite quantity (0.2 g) of dust in suspension was injected intraperitoneally into guinea pigs.

2. Dusts of two particle-size groups were used—one of screened material with particles less than 43 microns (325 mesh), and the other of air-separated material with particles varying from less than 2 to 8 microns in size.

3. The animals injected with the coarser material were examined 7, 14, 30, 56, and 112 days after injection, and those treated with the air-separated material were examined after 7, 14, 30, 56, and 90 days.

4. The response caused by the dust in the peritoneal cavity was

[16] From Pennsylvania. Petrographic examination showed from 1 to 2 percent inorganic content, essentially all calcite Median size of the particles, 1 15 microns

[17] From Pennsylvania Petrographic examination showed from 1 to 3 percent inorganic content, mainly quartz, calcite, and clay Median size of the particles, 1 19 microns

[18] Collected from stacks by electric precipitation Chemical examination showed 44 7 percent silica Petrographic examination showed predominantly perfectly spherical fused glass, rounded semifused masses made up of crystallites ,some quartz fragments, calcite, and coal. Median size of the particles, 1 43 microns.

constant in all of the animals injected with an individual dust and could be classified as an absorption, proliferative, or inert reaction.

5 In the absorption reaction the injected dust disappeared from the peritoneal cavity without the production of scar tissue.

6 In the proliferative reaction the nodules produced by the dust continued to increase in size up to 112 days after injection, the maximum duration of the tests in this series.

7. In the inert reaction the amount of injected dust remained approximately the same in the peritoneal cavity throughout the various periods, but the nodules became more flattened and fine particles of dust were carried over rather extensive areas in the peritoneum by phagocytes

8 Calcite, limestone, precipitated calcium carbonate, gypsum, and cement exhibited an absorption reaction

9 Quartz, chat, and flint produced a proliferative reaction.

10 Soapstone, carborundum, jeweler's rouge, anthracite coal, bituminous coal, and precipitator ash were inert in reaction.

CONCLUSIONS

The tissue of the peritoneal cavity responds actively to a dust introduced as a foreign body, and this response is of such a character that it may be used as a basis for the classification of industrial dusts from a physiological standpoint In this report, dusts of uniform chemical composition or those definitely known to produce or not to produce silicosis were used, and for this group the reaction occurring in the peritoneal cavity was uniform and constant for each dust. It seems probable, in view of the nature of the reactions, that dusts of mixed chemical composition will produce responses similar to those found in this series of dusts.

Tests of longer duration are now in progress to determine the ultimate fate of the dust in the peritoneal cavity; yet for purposes of obtaining a definite response to any dust 90 days appears to be a sufficient time interval between injection and examination.

ACKNOWLEDGMENT

Special acknowledgment is made to the Metropolitan Life Insurance Company, which defrayed part of the expenses incurred in this study. Acknowledgment is also made to the kindness of Mr. W. A. Selvig and Mr. A. H. Emery, of the United States Bureau of Mines, for the chemical and petrographical examinations of the dusts used in these experiments. The illustrations were made by the photographer of the Bureau of Mines.

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SULPHUR DIOXIDE FOR THE FUMIGATION OF SHIPS*

METHODS OF USE AND PROSPECTS OF IMPROVEMENT

By C L WILLIAMS, *Senior Surgeon, United States Public Health Service*

Sulphur dioxide has been used for many years in the United States for the disinfection of ships The discovery that germs were causes of disease and that they could be destroyed by fumigation became the basis of its employment for this purpose in the latter part of the past century While the procedure was utilized against all of the quarantinable diseases, it was employed most particularly against yellow fever—before the discovery that this disease is transmitted by the mosquito, in the hope of destroying the virus, and, after this discovery, for the purpose of destroying the vector

Fumigation with sulphur was the principal method utilized on ships in the United States until 1914, when hydrocyanic acid was introduced as a practical ship fumigant Before the appearance of the cyanide gases, a relatively brief competition was set up by funnel gases—that is, a mixture of carbon dioxide and carbon monoxide, but the apparatus proved too cumbersome for general use, and its failure to destroy fleas was considered a disadvantage for antiplague measures.

While today in the United States hydrocyanic acid has largely replaced sulphur, the latter is still in use at many of the smaller quarantine stations, where it is economically impracticable to maintain fumigation crews trained to use the more hazardous cyanide. About 30 percent of ship fumigations are performed with sulphur.

In the use of sulphur dioxide, the United States Public Health Service has never seriously departed from the method of producing this substance by burning sulphur, and has employed this method in two ways. One has been to burn the sulphur, in small lots, in iron pots placed inside the spaces to be fumigated; the other, to burn it in a specially constructed furnace, from which it was blown through large tubes into the ship. For a time sulphur furnaces were very

* Prepared for presentation to the Permanent Committee of the International Office of Public Hygiene at the meeting in May 1933 and published in the Bulletin Mensuel for August 1933.

largely employed; but, as their faults became apparent, they were abandoned, and today sulphur fumigation is almost exclusively performed in this country by burning sulphur in pots The amount of sulphur used per 1,000 cubic feet of space fumigated has always been prescribed by regulations; but accurate control of fumigation by chemical tests, to determine the actual percentage of fumigating gas present, has rarely been employed.

While the quarantine regulations provide that liquid sulphur dioxide is an acceptable fumigant, and prescribes the amounts to be used, it has been actually employed in ship fumigation in this country quite rarely, no doubt principally on account of the higher cost

METHODS OF USE

The utilization of sulphur dioxide by burning sulphur in iron pots is a method that has been universally employed and hardly needs description. As applied in the United States, special stress has been laid upon the absolute necessity of opening rat harborages and other enclosed spaces to permit ready access of the fumes, and the necessity of burning the sulphur in relatively small portions, so arranged that in each compartment there will be burned the total amount of sulphur necessary for the fumigation of that space, thereby providing for a more even distribution Fire hazards have always been minimized by placing the sulphur pots in shallow pans of water.

The sulphur furnace generally used in the United States was the Kinyoun-Francis furnace, consisting of a roasting pan on which the sulphur was burned, a baffled flue, a blower, and conveying tubes. Its principal disadvantage was that much of the sulphur was sublimed and deposited in the conveying tubes, with the result that the delivery of sulphur dioxide could seldom be accurately gaged. The Clayton apparatus never came into general use in this country.

It may be well here to comment upon certain other procedures for utilizing sulphur dioxide that are in use in Europe and other parts of the world, but not generally employed in the United States.

"Salforkose" undoubtedly represents an improved method of producing sulphur dioxide by burning Instead of sulphur, carbon bisulphide is burned under controlled conditions. The essential improvements consist in the more rapid production of a given amount of sulphur dioxide, its more even distribution caused by the more rapid combustion, and increased accuracy of dosage due to complete combustion.

In many ports the Clayton apparatus is employed. It consists essentially of a sulphur furnace, producing sulphur dioxide by burning sulphur, from which the gas is drawn through cooling tubes surrounded by flowing water and then blown into the ship As generally employed, air is also drawn from the ship and circulated through the

furnace, the net result being the introduction of sulphur dioxide and the abstraction of oxygen in the same process. From accounts available, in order to insure efficient operation this apparatus must be controlled by testing the concentration of sulphur dioxide actually produced in the ship

Liquid sulphur dioxide is used in a few ports In some, it is employed by attaching to a cylinder of this substance a section of hose which is led into the space to be fumigated; the valve on the cylinder is then opened and the evaporating gas is permitted to pass out through the hose This method has the very serious disadvantage that evaporation and expansion of the gas cause marked chilling, so that after a few minutes delivery becomes very much slower and may even stop entirely, owing to the freezing of water in the valve. To obviate this defect, recourse has been had to inverting the cylinders and delivering the liquid sulphur dioxide through an outlet hose and spray nozzles. This appears to be a preferable method.

"Marot gas" consists of liquid sulphur dioxide that is vaporized by being passed through a furnace from which it may either be blown into a ship by a blower, or carried through a hose under its own pressure. Theoretically, this method represents an improvement in the use of liquid sulphur dioxide but has the practical disadvantage of requiring bulky apparatus.

The use of liquid sulphur dioxide has one material advantage over other methods in that it permits of accurate dosage. The actual amount of the liquefied gas that is used can be definitely determined by weighing the cylinders during the process of discharge. Liquid sulphur dioxide, having twice the molecular weight of sulphur, theoretically must be used in quantities twice as great.

AMOUNT USED AND TIME OF EXPOSURE

In the United States, 6 hours or longer has always been the period of exposure for sulphur fumigations on empty ships, and 12 hours or longer in loaded holds Generally from 3 to 5 pounds of sulphur have been burned per 1,000 cubic feet. Theoretically, this would produce from 6 to 10 pounds of gaseous sulphur dioxide per 1,000 cubic feet, a theoretical concentration of 3.28 to 5.47 volume percent

When liquid sulphur dioxide is used, from 6 to 10 pounds per 1,000 cubic feet are prescribed Probably, in view of the greater accuracy of dosage and the more rapid production of maximum concentration, this results, in effect, in a larger dosage than when sulphur is burned.

DEFECTS OF SULPHUR DIOXIDE

However produced, sulphur dioxide exhibits certain inherent defects as a fumigant. Primarily there is the relatively high density of the gas, which prevents rapid and even diffusion and materially

slows penetration into retired spaces, particularly through small openings. The result, in comparison with such a gas as hydrocyanic acid, is an unavoidable reduction of effectiveness, an unevenness of action, and a prolongation of the fumigation, due both to a necessarily prolonged exposure period and to a relatively prolonged period required to remove the gas after fumigation.

Effectiveness is still further reduced by the high rate of absorption of this gas in water, the latter taking up some thirty times its volume In ships' holds containing much moisture, this is a material factor

A secondary defect of sulphur dioxide is the damage that it produces to certain cargoes and to various ships' fittings. This factor is economically sufficiently important to cause owners of most passenger ships greatly to prefer fumigation with hydrocyanic acid. It should be borne in mind that the term "damage" includes fire hazard in all cases where sulphur is burned inside of the ship.

When sulphur is burned, there are certain other considerations that lower effectiveness. To begin with, the sulphur itself is rarely 100 percent pure. In the second place, frequently a very considerable portion of the sulphur fails to burn; and when it all burns, complete combustion generally requires 2 to 4 hours or longer. In the third place, it is doubtful whether all of the sulphur is converted into sulphur dioxide, certainly, chemical tests will show that the theoretical concentration is never attained It would seem that the substitution of "Salforkose" for sulphur would reduce most of the disadvantages enumerated in this paragraph

The use of liquid sulphur dioxide involves at once the mechanical difficulty of rapidly introducing the required dosages. De Bruyne, in Rotterdam, and Gilmour, in Alexandria, have both unofficially reported that extended periods, up to several hours, were required to spray a full dose into ships' holds. At the New York quarantine station an air-jet sprayer has been developed to deliver liquid sulphur dioxide at a maintained rate of 4 pounds a minute. To fumigate a hold of 100,000-cubic-foot capacity requires (under present United States regulations) 600 pounds of this material, which, with only one sprayer, would take nearly 3 hours to introduce. The use of large-bore pressure tubing, adequate valves, and multiple spray nozzles appears to be indicated.

The Marot apparatus probably does not deliver the sulphur dioxide any more rapidly than does a single sprayer. It has the advantage of heating the gas, thus aiding diffusion. To deliver a heated gas rapidly in large amounts would require a rather considerable heat supply. Whenever rather cumbersome apparatus is not too great a disadvantage, however, this method would appear to be the best so far devised for utilizing liquid sulphur dioxide as a fumigant.

When liquid sulphur dioxide is introduced into a space, the chilling due to evaporation and expansion produces an increase in density of this gas (normally more than twice as heavy as air) and its tendency to settle to the floor is thereby increased. As a matter of fact, the greater part of the gas does settle to the lower levels and leaves the space at the top of the compartment almost free from gas Under test conditions at the New York quarantine station it has been found that, when fumigating with liquid sulphur dioxide in the amount of 1 pound per 1,000 cubic feet, if the air is not agitated, rats placed on the floor will die in a few minutes, while those within 1 or 2 feet of the ceiling remain alive as long as 2 hours. Concentration tests in such instances disclose a concentration four times as high near the floor as near the ceiling.

When sulphur is burned in a furnace and blown into a ship, accurate and even distribution should not be expected unless determined by chemical tests of air samples drawn from fumigated compartments. As a matter of fact, any method of burning sulphur is likely to be highly inaccurate unless checked by chemical testing of concentration. This adds one more piece of apparatus to an already complicated equipment.

EFFECTIVENESS OF SULPHUR DIOXIDE

The subject of effectiveness will be considered only as it concerns the destruction of rats on ships.

The most completely illustrative example, of which the writer is aware, of both the effectiveness and ineffectiveness of sulphur dioxide is cited by Grubbs and Holsendorf (*1*) from the Report of the Board of Health on Plague in New South Wales, 1907. It is quoted as follows

The Adelaide Steamship Co.'s *Innamincka* runs from Melbourne, Victoria; in the south to Cairns, Queensland; in the north carrying general cargo and passengers; going south her cargo consists chiefly of sugar and bananas. She calls at Sydney, New South Wales, and at Brisbane, Makay, Townsville, Bowen, and Cairns, Queensland She is empty only at Melbourne and at Cairns, and at these ports is fumigated for destruction of rats On the voyage now spoken of, the *Innamincka* reached Sydney May 21 from Cairns, where she had been fumigated as usual, and sailed again for Melbourne on the 22d. During the night of May 21 a rat catcher of the intelligence staff set many traps on board and found the next morning that 18 live rats had been caught; in addition he found one dead rat lying beside the cages The live rats were kept for some time and remained healthy, but the dead rat was found to be infected with plague. The vessel having sailed in the meantime, Melbourne was warned by telegraph. On arrival there on the afternoon of May 24 the vessel was arrested, anchored in the stream, and fumigated with her cargo on board The next morning hatches were opened, she was taken alongside, and discharge of cargo was begun. In the course of discharging, 160 carcasses were found.

Having been emptied, she was placed under sulphur a second time on the afternoon of May 25, and when hatches were again opened on May 26, 164 more carcasses were turned out After examination a number of these carcasses were declared to be plague infected The ship was then thought to be rid of rats She took on eight to nine hundred tons of cargo and sailed for Sydney as usual on her return voyage to the north. On arrival at Sydney, May 29, she was searched by the intelligence staff, under supervision of the chief sanitary inspector, and 41 live rats and 22 carcasses were collected Consequently all of the cargo aboard was ordered out, and during the unloading 35 rats were killed and 34 more carcasses were found The ship was then placed under sulphur for 12 hours, with the result of finding 509 carcasses of rats, 12 of mice, and 2 rats alive, though dying Nevertheless live rats were still heard; the reason was afterwards found to be existence of a hole of communication between a forward hold and a cross bunker in which some rats had found protection from the fumes among the coal It was thought necessary, therefore, to empty all the bunkers, this took 36 hours of continuous work Then the afterpart of the vessel with the engine rooms and stokeholds were first filled with sulphur fumes, after which a second fumigation of the forward holds commenced After this, 70 carcasses were found, but no live rats, and it was at length possible to say that no rats, alive or dead, remained on board On June 3 she was released, and, after loading, pursued her voyage. Altogether 734 rats were delivered at the board's laboratories on or after May 29, of which about 160 were putrid; 70 of them were examined bacteriologically, being selected from the batches successively brought in, and including some of the putrid carcasses; 44 of these yielded positive films, and from 4 of them positive cultures of *B pestis* were recovered. In all, 1,077 rats were destroyed on the ship.

Two superficial conclusions can be drawn from this report: The first is that fumigation by burning sulphur definitely kills rats; over 1,000 were killed by this means in this instance. The other is that many rats escape such single fumigations. It will be noted that at least 70 escaped 4 fumigations, finally succumbing to the last. Likewise, it can be calculated that 657 rats went through 3 fumigations, 877 rats through 2 fumigations, etc. It is most noteworthy that 75 percent passed through the first three fumigations and that most of these were destroyed only when a fumigation was performed with extra care and doubled exposure.

A third, more deeply hidden conclusion might be drawn, in conjunction with other fumigation experiences. It will be made more clear if a specific instance of fumigation with hydrocyanic acid is cited.

On October 24, 1926, the S.S. *Manila Maru* arrived in New Orleans with two cases of human plague on board. The ship was fumigated loaded and was then unloaded in the stream into lighters, this process being twice interrupted for fumigations. When empty, it was again fumigated. All four fumigations were with hydrocyanic acid gen-

erated in barrels, placed in the holds and superstructure, by adding sodium cyanide (10 ounces per 1,000 cubic feet) to dilute sulphuric acid After every fumigation, rats, that had survived previous fumigations (specific figures are not now at hand), were recovered, though only five of these were recovered after the fumigation when empty. In all, 431 rats were killed

Obviously, rats may escape multiple cyanide fumigations as well as those with sulphur This brings us to the essential conclusion as regards all ship fumigations, which is that, to secure effective results, it is necessary that the way be opened for the gas to penetrate into the deep places where rats will seek to escape This means that the ship must be properly prepared for fumigation, particularly that enclosed spaces be opened sufficiently so that the gas, whatever fumigant is used, will penetrate in lethal concentration This is a part of their work that fumigators in general are loath to perform. Were it generally carried out conscientiously and intelligently, the margin of variation in effectiveness between different gases would be markedly reduced

When we cross over to loaded ships, however, a different picture presents itself The presence of cargo prevents access to, and the opening of, many harborages At once, the gas that is the more penetrating and lethal in lowest concentration secures a marked advantage That hydrocyanic acid possesses such an advantage over sulphur dioxide appears in the two instances cited, for 3 fumigations with HCN, performed while cargo was still in the holds, destroyed 99 percent of the rats, while 3 fumigations with sulphur (2 when the ship was empty) killed only 39 percent of the rats present. Whether the variation would have been as great had one of the methods in which the gas is blown into the hold been used is unlikely. Burning sulphur in a fully loaded hold is a peculiarly futile procedure. Very much the same applies, however, to the generation of hydrocyanic acid in barrels placed in fully loaded holds In both instances the gas is generated only on one level and does not penetrate in appreciable amount to the levels below. With these or similar methods of introducing the fumigant, reasonably good results can be secured in loaded holds only when cargo is removed from the hatchways till all levels are accessible.

Very few direct comparisons of the effectiveness of sulphur dioxide and hydrocyanic acid have ever been carried out. The observations of Creel and Simpson (*2*) are most often cited on this point In their work, fumigations were performed by burning sulphur in pots or by generating hydrocyanic acid in barrels—in both cases inside of

compartments fumigated Results were checked by subsequent trapping. They are summarized in the following tabulation:

TABLE 1.—*Comparisons of effectiveness of SO_2 and HCN*

Fumigant used	Number of vessels	Compartment considered	Number of rats killed by fumigation	Number of rats subsequently trapped	Efficiency of fumigation (percent)
Sulphur dioxide	62	Entire ship	747	223	77
Cyanide gas	182	do	2,811	121	95
Sulphur dioxide	32	Superstructure	133	107	55
Cyanide gas	31	do	729	15	94
Sulphur dioxide	28	Holds, empty	702	28	96
Cyanide gas	34	do	851	9	99
Sulphur dioxide	10	Holds, loaded	104	59	64
Cyanide gas	10	do	80	20	80

Comparative penetration tests with SO_2 and HCN have been carried out at the New York quarantine station. For this purpose rats have been protected by placing them in boxes tightly sealed except for a varying number of ¼-inch holes at one end. Rats in boxes provided with 2 holes were always killed in 2 hours by fumigation with 2 ounces HCN per 1,000 cubic feet; those in boxes with 10 holes died within ½ hour; the effect in boxes with intervening numbers of holes varied proportionately between these extremes. When sulphur dioxide was used by burning 3 pounds of sulphur per 1,000 cubic feet, rats in boxes having 2 holes survived 6 hours' exposure; those in boxes with 4 holes died in about 6 hours; those in boxes with 6 holes died in 3 hours; those in boxes with 8 holes died in 2½ hours; and those in boxes with 10 holes died in 2 hours.

TOXICITY OF SULPHUR DIOXIDE

Sulphur dioxide, when breathed, is absorbed by the moisture on the mucous surfaces over which it passes The solution is an irritant and destructive acid and at once sets up severe irritation of these surfaces, eliciting an inflammatory response. In the lungs this inflammatory response is associated with edema, which causes asphyxiation and death. The rapidity with which this occurs is largely a matter of the concentration of the gas.

Quite small amounts produce distinct irritation without material injury; this is the warning range. As the concentration is increased somewhat, the effect is not immediate death but sufficient tissue damage to cause pneumonia to supervene, the victim dying (or recovering) some hours or days later. Further increased concentration produces death after several hours through edema of the lungs. From this point the period of survival is roughly inversely proportional to the concentration of the gas, until a point is reached, which, according to Clark (*3*), is for rats 2 percent (by volume), in

which concentration death occurs within 5 or 6 minutes. Increase of concentration above this point appears to have little additional effect. In rats dying during fumigation, inflammation and edema of the lungs and respiratory surfaces and opacity of the cornea are about the only lesions.

For fumigation purposes it is desirable to use sufficient gas to produce death during the period of exposure At the New York quarantine station it has been determined experimentally that approximately 0 1 percent by volume causes death of exposed rats in 2 to 4 hours, 0 2 percent causes death in 1 to 2 hours, 0 3 percent causes death in 1 hour or less; and 0 5 percent kills rats in ½ hour. This latter is the concentration produced by vaporizing 1 pound of liquid sulphur dioxide in 1,000 cubic feet of air These figures are for rats exposed in the open They represent the concentrations that must be attained, not in the open hold of a ship, but in the secluded rat harborages, to produce effective results.

DOSAGES AND EXPOSURES

The dosage of hydrocyanic acid used in the United States is 10 times that which will kill a rat in 30 minutes. On the same basis for sulphur dioxide, a concentration of 5 percent would be demanded. There are, however, material points of variation that must modify this proportion. Most important is that extension of the lethal effect of SO_2 beyond the period of the fumigation itself provides a material safety margin not available with HCN. Largely for this reason it is suggested that the concentration producing death in 1 to 2 hours constitutes a more reasonable minimum lethal concentration and that the concentration prescribed for fumigation should be not less than 2 percent. The concentration should be determined either by actual introduction of 4 pounds of liquid SO_2 per 1,000 cubic feet, or by chemical tests.

In view of the known relatively slow diffusion rate of sulphur dioxide and of its demonstrated reduced effectiveness as compared with HCN, and taking into account its slower mechanism of poisoning, it seems reasonable that it should be given a longer period to exert its effects. Its weight and slowness of diffusion permit long exposures (particularly in ships' holds where ventilation is principally through the hatch at the top), loss by leakage being relatively slow.

Stock (4) has suggested 8 hours as a minimum when sulphur is burned in the ship, this being based on investigations in England. In view of the slowness and inaccuracy of this method, this period of exposure is undoubtedly justified. If "Salforkose" is burned instead of sulphur, a material reduction in exposure would appear to be justified.

When sulphur dioxide gas is blown in from outside, accuracy can probably best be secured by dating the exposure period from the time when concentration in the space fumigated reaches 2 percent as determined by test If this is done, it would seem that exposure could be reduced probably to 4 hours A similar reduction in exposure for liquid sulphur dioxide would appear to be in order if exposure is dated from the time when the full dose has been introduced. In both of these cases, however, a reduction of prescribed exposure is likely to be confusing for the reasons that, in actual practice, fumigators are prone to time exposure from the moment when gas introduction is started and that it is doubtful whether there are many seaports where operation of the Clayton apparatus is actually controlled by testing concentration When a method of rapidly introducing liquid sulphur dioxide is developed, one that will permit of introducing the full dosage in 30 minutes, it may be that reduction of exposure, when this material is used, may be in order

In the present state of knowledge concerning sulphur dioxide, it is doubtful whether the United States Public Health Service would care to see the exposure time reduced to less than 6 hours, regardless of the method used

FUMIGATION OF LOADED VESSELS

As has already been stated, the fumigation of a loaded hold by burning sulphur (or "Salforkose") therein is a futile procedure unless the hatchways have been cleared Clearing of the hatchways means removal of the cargo from them to a level well below the lowest 'tween-deck so that the gas generated will have a clear road to all levels of the hold

When the gas is pumped in from outside it may be introduced into all levels by blowing it down a ventilator The practical application of this procedure, however, involves several mechanical difficulties, chief among them being the variation in relative pressure which will, in most cases, result in most of the gas passing into the upper level and the least amount into the lowest. It should not be too difficult to overcome this difficulty by using a properly adapted apparatus and by intelligent attention to details, such, for example, as passing the delivery tube down the ventilator directly into the various levels

Liquid sulphur dioxide can undoubtedly be introduced by way of ventilators, into the various levels of loaded holds, in quite accurate amounts Such procedure involves, however, the spraying of quite large quantities—hundreds of pounds— directly on the cargo stowed near the ventilator. What damage this might cause has not as yet been thoroughly investigated. Liquid SO_2 vaporized by heat and then blown into the different levels of holds would apparently not be subject to this objection. By such means, when using relatively small-bore hose and right-angled delivery nozzles, it should be practicable

to introduce reasonably accurate doses into the different levels without too great losses from return of the gas up the ventilator tubes.

It has already been brought out that, in loaded holds, sulphur dioxide appears to be decidedly less effective than hydrocyanic acid. However, it should be noted that the problem of introducing the gas has never been thoroughly worked out through the medium of completely controlled and subsequently checked-up fumigations The work of Creel and Simpson included too few loaded ships and should be extended by testing other methods of introducing the gas

HAZARDS

As compared with hydrocyanic acid, sulphur dioxide is only slightly hazardous. Records of death and injury due to sulphur fumigation are far too few to doubt that this is true Even should we ascribe to effects of the gas all deaths from pneumonia following exposure to SO_2, it is not believed that the total would approach the record of known fatalities caused by cyanide fumigations. On the other hand, in proportion to the number of fumigations of all kinds, the total number of fatalities from this source is relatively small. Compared with deaths from plague, following its introduction into infectible territory, deaths from fumigation are but a drop in the bucket—a very small drop in a very large bucket

This brings us to the point of view from which fumigation hazards are actually evaluated in most countries. Generally, the relative hazard of the procedure is balanced against the relative effectiveness in preventing the introduction of disease. A third factor is making an appearance as regards plague, that being the relative damage that may ensue if the disease is introduced. In certain parts of the world appears a fourth factor in the matter of local reaction to fumigation deaths. From the viewpoint of these factors, the present trend is in favor of the most effective procedure, even though it is adopted at the expense of a greater number of fatalities.

Further to discuss hazards from this viewpoint would be futile. In each country, authorities will doubtless determine procedures as these factors directly affect them. This point, however, should be brought out; that is, that with the present practice in force, of almost universal acceptance of fumigation certificates, whatever procedure is carried out in any one port, of necessity affects to some degree the safety of other ports visited by the same ships.

COMMENT

At the time of writing there does not appear to be sufficient accurate data at hand scientifically to evaluate fumigation of ships with sulphur dioxide. There are particularly required: (1) Determina-

tions of concentrations actually present in various spaces fumigated with SO_2, especially inside of enclosed and partly enclosed areas, rat harborages and the like; (2) test fumigations with this fumigant, followed by very carefully conducted refumigations (these preferably with cyanide), as well as by trapping and inspections to determine relative effectiveness

Until data of this precise nature are at hand, it is tentatively suggested that the minimum standards should prescribe that concentrations of not less than 2 percent SO_2 by volume should be produced in spaces fumigated, and that exposure should be for not less than 6 hours from the time of starting the gas nor less than 4 hours from the time when a 2-percent concentration is reached.

REFERENCES

(1) Grubbs, S B , and Holsendorf, B. E.: Fumigation of vessels for the destruction of rats Pub Health Rep., **28**, 1266–1274 (June 20, 1913)

(2) Creel, R H , and Simpson, F.: Rodent destruction on ships Pub Health Rep , **32**, 1445–1450 (Sept. 7, 1917).

(3) Clark, G. A . Rat destruction by sulphur dioxide. Journal of the Royal Naval Medical Service, April 1932.

(4) Stock, P. G · The use of sulphur, at ports in the United Kingdom, as a fumigant for the destruction of rats on ships. A note submitted to the Office International d'Hygiène publique at the meeting held in April 1932.

COURT DECISION RELATING TO PUBLIC HEALTH

Certain statutory provisions as to pollution of waters construed.—(Texas Court of Civil Appeals; *Turner et al.* v. *Big Lake Oil Co. et al.*, 62 S W.(2d) 491; decided June 29, 1933.) Article 698 of the penal code of Texas and chapter 42 of the laws of the first called session of the 42d legislature of Texas related to the pollution of waters Article 698 mentioned "any watercourse or other public body of water", while chapter 42 mentioned "any stream, watercourse or natural body of water of this State". The court of civil appeals held that article 698 referred to public bodies of water and had no application to privately owned watering holes. Respecting chapter 42 the court was of the opinion that the words "natural body of water of this State" referred to waters owned by the State in trust and not to waters privately owned. Said the court: "We think the phrase 'of this State' is used in the sense of ownership."

DIRECTORY OF STATE HEALTH AUTHORITIES—ILLINOIS—A CORRECTION

In the Public Health Reports of December 22, 1933, page 1520, Herman N. Bundesen, M D., is named as chairman of the Board of Public-health Advisors of the State of Illinois. This is an error; Clifford U. Collins, M.D., is the chairman of the board.

DEATHS DURING WEEK ENDED DECEMBER 30, 1933

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Dec 30, 1933	Corresponding week 1932
Data from 85 large cities of the United States		
Total deaths	8,738	10,279
Deaths per 1,000 population, annual basis	12 2	14 7
Deaths under 1 year of age	616	713
Deaths under 1 year of age per 1,000 estimated live births (81 cities)	53	58
Deaths per 1,000 population, annual basis, first 52 weeks of year	11 0	11 2
Data from industrial insurance companies.		
Policies in force	67,260,416	69,085,125
Number of death claims	12,699	15,146
Death claims per 1,000 policies in force, annual rate	9 8	11 5
Death claims per 1,000 policies, first 52 weeks of year, annual rate	9 8	9 6

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended January 6, 1934, and January 7, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan 6, 1934, and Jan. 7, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan 6, 1934	Week ended Jan 7, 1933	Week ended Jan 6, 1934	Week ended Jan 7, 1933	Week ended Jan 6, 1934	Week ended Jan 7, 1933	Week ended Jan 6, 1934	Week ended Jan 7, 1933
New England States								
Maine		3	20	578	2	1	0	0
New Hampshire	5	1	2		103	2	0	0
Vermont		2			64		0	0
Massachusetts	13	33		173	945	141	1	1
Rhode Island	3	5		74	2		0	0
Connecticut	2	14	13	89	21	84	0	2
Middle Atlantic States								
New York	59	65	[1] 26	[1] 794	573	854	3	5
New Jersey	29	26	22	419		260	2	2
Pennsylvania	70	79			501	374	1	4
East North Central States								
Ohio	33	61	29	531	103	332	0	3
Indiana	36	79	56	1,652	166	15	2	6
Illinois	28	64	18	186	141	81	6	22
Michigan	13	17		147	7	239	1	0
Wisconsin	9	9	40	6,431	163	193	1	5
West North Central States								
Minnesota	4	5	1	35	64	230	0	2
Iowa [2]	13	18	2	1,717	67	3	3	8
Missouri	60	37	11	200	321	32	1	3
North Dakota	5	1		1,888	45	64	0	1
South Dakota	2	6	1	205	157	7	0	0
Nebraska	11	10	11	268	33	3	0	0
Kansas	17	12	1	7,923	31	33	1	1
South Atlantic States								
Delaware	4	6		2	5	1	1	0
Maryland [2]	11	13	31	2,064	16	9	1	2
District of Columbia	8	6	1	21	60	2	0	2
Virginia	69	31			232	139	2	2
West Virginia	20	23	81	4,018	9	157	0	1
North Carolina [3, 4]	48	23	28	1,827	1,021	314	0	2
South Carolina [3]	23	13	960	3,667	367	63	0	0
Georgia [3]	13	15		1,490	807		2	1
Florida [3]	4	8	1	102	1	1	0	0
East South Central States.								
Kentucky	43	29	8	4,428	10		0	6
Tennessee	26	11	84	2,614	325	5	3	1
Alabama [3]	29	23	76	2,475	195		0	2
Mississippi [2]	15	7					1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan 6, 1934, and Jan 7, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan 6, 1934	Week ended Jan 7, 1933	Week ended Jan 6, 1934	Week ended Jan 7, 1933	Week ended Jan 6, 1934	Week ended Jan 7, 1933	Week ended Jan 6, 1934	Week ended Jan 7, 1933
West South Central States								
Arkansas	16	7	10	11,138	159	4	1	0
Louisiana	26	16	9	653	11	8	0	3
Oklahoma [5]	75	18	93	1,960	73		3	1
Texas [3]	147	285	288	4,452	270	20	2	1
Mountain States								
Montana	1	2	17	5,493		175	0	0
Idaho	1	5		5	20	12	0	0
Wyoming				15	45	14	0	0
Colorado	13	4		138	8	6	0	0
New Mexico	5	3		7	59	2	0	0
Arizona	4	3	21	26	8		3	0
Utah [2]		1		12	558	1	1	0
Pacific States								
Washington	1	4		11	284	1	0	1
Oregon	1	1	51	1,274	46	24	0	1
California	28	51	39	1,039	390	98	0	7
Total	1,043	1,155	2,051	72,241	8,578	4,004	42	98

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan 6, 1934	Week ended Jan 7, 1933	Week ended Jan 6, 1934	Week ended Jan 7, 1933	Week ended Jan 6, 1934	Week ended Jan 7, 1933	Week ended Jan 6, 1934	Week ended Jan 7, 1933
New England States:								
Maine	0	2	8	29	0	0	1	0
New Hampshire	0	0	7	21	0	0	1	0
Vermont	1	0	20	28	0	0	0	1
Massachusetts	0	1	168	347	0	0	1	2
Rhode Island	0	0	10	37	0	0	1	0
Connecticut	0	0	63	91	0	0	0	0
Middle Atlantic States								
New York	2	1	528	637	0	0	6	10
New Jersey	2	1	144	245	0	0	5	1
Pennsylvania	0	3	569	602	0	0	11	20
East North Central States:								
Ohio	1	1	372	569	2	9	1	7
Indiana	0	0	168	164	5	3	0	2
Illinois	1	2	401	414	0	3	4	0
Michigan	0	0	150	152	0	1	2	1
Wisconsin	1	1	60	62	24	1	0	4
West North Central States.								
Minnesota	1	1	40	76	3	3	2	0
Iowa [2]	0	0	79	25	7	39	0	0
Missouri	0	0	134	108	12	4	3	3
North Dakota	0	0	27	23	0	0	1	0
South Dakota	0	0	35	6	1	2	0	173
Nebraska	0	1	30	46	2	1	0	0
Kansas	0	1	110	71	7	2	1	0
South Atlantic States								
Delaware	0	0	7	10	0	0	0	0
Maryland [2]	0	0	81	81	0	0	4	7
District of Columbia	0	0	13	14	0	0	0	0
Virginia	0	0	126	65	0	0	15	11
West Virginia	1	0	82	56	0	1	1	0
North Carolina [3] [4]	1	0	83	46	0	0	7	4
South Carolina [3]	1	2	15	9	0	2	8	2
Georgia [3]	0	1	9	5	0	0	5	5
Florida [3]	0	0	4	3	0	0	1	5
East South Central States.								
Kentucky	0	0	79	40	0	1	1	2
Tennessee	1	1	87	40	0	0	6	10
Alabama [3]	0	0	29	27	0	2	4	1
Mississippi [2]	0	0	25	19	1	0	8	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 6, 1934, and Jan. 7, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 6, 1934	Week ended Jan. 7, 1933	Week ended Jan. 6, 1934	Week ended Jan. 7, 1933	Week ended Jan. 6, 1934	Week ended Jan. 7, 1933	Week ended Jan. 6, 1934	Week ended Jan. 7, 1933
West South Central States								
Arkansas	0	0	11	26	1	2	0	0
Louisiana	2	0	10	12	0	2	7	6
Oklahoma [5]	0	0	39	17	3	0	3	1
Texas [3]	0	0	148	70	26	5	20	9
Mountain States								
Montana	0	0	7	13	4	5	4	1
Idaho	0	0	13	2	0	7	1	1
Wyoming	0	0	5	5	0	0	0	0
Colorado	0	0	26	60	2	0	1	2
New Mexico	1	0	24	19	0	0	4	1
Arizona	0	0	13	5	0	0	0	1
Utah [2]	0	0	10	22	0	0	0	0
Pacific States								
Washington	0	1	40	20	2	13	0	1
Oregon	0	0	51	29	8	2	2	3
California	2	3	198	159	10	9	18	11
Total	18	22	4,358	4,717	120	119	160	310

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Jan. 6, 1934, 29 cases, as follows: North Carolina, 4; South Carolina, 2; Georgia, 3; Florida, 1; Alabama, 15; Texas, 4.
[4] Rocky Mountain spotted fever, week ended Jan. 6, 1934, North Carolina, 1 case.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November 1933										
Mississippi	2	146	898	4,679	670	291	2	151	13	45
December 1933										
Arkansas		80	117	177	596	20	0	88	11	7
Connecticut	5	26	45		42		1	240	0	1
Delaware	1	4	6		17		2	34	0	3
Maine		14	32		5		2	34	0	4
Missouri	6	361	46	2	560		1	743	19	26
Nebraska	3	28			39		3	151	11	11
Wyoming					112		0	34	0	0

November 1933

	Cases
Mississippi:	
Chicken pox	333
Dengue	15
Dysentery (amoebic)	76
Hookworm disease	353
Mumps	81
Puerperal septicemia	24
Rabies in animals	2
Trachoma	1
Undulant fever	1
Whooping cough	336

December 1933

	Cases
Botulism:	
Connecticut	1
Chicken pox:	
Arkansas	111
Connecticut	554
Delaware	35
Maine	251
Missouri	413
Nebraska	325
Wyoming	87
Conjunctivitis (infectious):	
Connecticut	1

December 1933—Continued

	Cases
Dysentery:	
Connecticut (amoebic)	1
Missouri	29
Nebraska (amoebic)	11
German measles:	
Connecticut	6
Maine	96
Wyoming	63
Hookworm disease:	
Arkansas	8
Lead poisoning:	
Connecticut	3

December 1933—Continued

	Cases
Lethargic encephalitis	
Connecticut	1
Missouri	22
Nebraska	1
Mumps	
Arkansas	9
Connecticut	255
Delaware	1
Maine	9
Missouri	116
Nebraska	22
Wyoming	7
Ophthalmia neonatorum	
Connecticut	1
Rabies in animals	
Connecticut	7
Missouri	28

December 1933—Continued

	Cases
Septic sore throat	
Connecticut	7
Missouri	33
Nebraska	1
Wyoming	4
Tetanus	
Maine	1
Trachoma	
Arkansas	2
Trichinosis	
Connecticut	1
Tularaemia	
Missouri	32
Undulant fever	
Arkansas	1
Connecticut	1

December 1933—Continued

	Cases
Undulant fever—Contd	
Delaware	1
Maine	4
Missouri	1
Nebraska	1
Vincent's infection	
Maine	6
Whooping cough	
Arkansas	67
Connecticut	167
Delaware	33
Maine	269
Missouri	207
Nebraska	183
Wyoming	8

WEEKLY REPORTS FROM CITIES

City reports for week ended Dec 30, 1933

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	6	0	0	0	1	5	20
New Hampshire											
Concord	1	------	0	0	2	1	0	0	0	0	13
Manchester	0	------	1	1	1	2	0	0	0	0	21
Nashua	0	------	0	0	0	2	0	0	0	0	--------
Vermont											
Barre	0	------	0	19	0	0	0	0	0	0	2
Burlington	0	------	0	0	0	1	0	0	0	0	15
Massachusetts:											
Boston	3	------	2	205	37	53	0	11	0	44	243
Fall River	1	------	0	0	2	3	0	2	0	0	24
Springfield	0	------	1	0	2	1	0	1	0	13	42
Worcester	3	------	0	192	7	2	0	0	0	9	46
Rhode Island											
Pawtucket	0	------	0	0	0	0	0	0	0	0	24
Providence	4	------	1	0	6	8	0	2	0	7	66
Connecticut											
Bridgeport	0	------	0	1	3	12	0	2	0	1	33
Hartford	0	------	0	0	2	6	0	2	0	0	52
New Haven	0	------	0	0	2	1	0	0	0	3	48
New York											
Buffalo	1	------	1	154	18	22	0	8	0	27	163
New York	22	14	8	26	199	167	0	99	1	74	1,643
Rochester	2	------	0	2	5	14	0	0	0	9	69
Syracuse	1	------	0	0	4	8	0	0	0	25	48
New Jersey:											
Camden	0	------	0	18	3	12	0	2	0	0	33
Newark	0	3	0	1	12	9	0	7	0	19	107
Trenton	0	2	0	1	0	10	0	2	0	2	35
Pennsylvania:											
Philadelphia	0	13	5	178	44	62	0	22	1	30	552
Pittsburgh	10	7	2	4	38	29	0	4	0	34	199
Reading	1	------	0	2	5	9	0	0	0	8	36
Ohio											
Cincinnati	------	------	------	------	------	------	------	------	------	------	------
Cleveland	12	41	3	1	25	29	0	16	0	31	233
Columbus	3	2	2	1	9	31	0	2	0	6	79
Toledo	2	1	1	29	6	26	0	5	0	8	80
Indiana:											
Fort Wayne	4	------	0	0	1	3	0	0	0	0	21
Indianapolis	2	------	0	6	10	11	0	4	2	7	--------
South Bend	0	------	0	0	1	6	0	0	0	0	15
Terre Haute	2	------	1	25	0	2	0	0	1	0	17
Illinois											
Chicago	0	2	6	7	51	195	0	31	1	93	695
Cicero	0	------	0	0	0	0	0	0	0	0	10
Springfield	1	1	1	0	4	2	0	0	0	6	16
Michigan:											
Detroit	7	2	1	6	22	84	0	13	0	49	248
Flint	0	------	0	3	1	44	0	2	1	2	29
Grand Rapids	0	------	1	0	4	11	0	0	0	1	38

City reports for week ended Dec 30, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Wisconsin											
Kenosha	0		0	0	1	9	0	0	0	3	11
Madison	0		1	1	2	4	0	0	0	8	33
Milwaukee	1	2	1	4	9	22	0	8	0	43	106
Racine	0	1	0	0	0	10	0	1	0	1	10
Superior	0		0	0	0	0	0	1	0	2	4
Minnesota											
Duluth	0		0	1	5	0	0	0	0	0	24
Minneapolis	5		0	0	11	8	0	0	0	0	106
St Paul	0		0	0	8	6	0	0	0	3	72
Iowa											
Des Moines	3			0		9	0		0	0	34
Sioux City	1			1		1	0		0	0	
Waterloo	0			6		2	0		0	15	
Missouri											
Kansas City	6		0	2	16	20	0	5	0	16	100
St Joseph	1		0	1	1	3	0	0	0	0	11
St Louis	20	2	1	117	16	15	0	7	4	18	225
North Dakota											
Fargo	0		0	13	0	1	0	0	0	0	8
Grand Forks	0		0	0	0	0	0	0	0	0	
South Dakota											
Aberdeen	0		0	0	0	0	0	0	0	0	
Sioux Falls	0		0	55	0	0	0	0	0	0	7
Nebraska											
Omaha	3		0	4	7	7	2	2	1	5	54
Kansas											
Topeka	0		0	0	4	6	0	2	0	6	39
Wichita	1		0	0	2	8	0	3	0	7	27
Delaware											
Wilmington	3		0	12	7	4	0	0	0	3	50
Maryland											
Baltimore	2	23	5	4	32	29	0	12	0	67	248
Cumberland	2	1	0	0	4	3	0	0	0	0	13
Frederick	0		0	0	0	1	0	0	0	0	6
District of Columbia											
Washington	9	1	0	48	17	19	0	9	2	14	173
Virginia											
Lynchburg	2		0	0	0	1	0	0	0	0	5
Norfolk	0		0	0	5	5	0	0	0	0	28
Richmond	4		1	0	6	13	0	4	1	0	45
Roanoke	1		0	0	1	3	0	0	0	2	16
West Virginia											
Charleston	0	1	0	0	4	4	0	0	0	0	14
Huntington	2		0	0	0	17	0	0	0	0	
Wheeling	0		0	1	5	3	0	0	0	0	16
North Carolina											
Raleigh	0		0	0	0	0	0	0	0	1	2
Wilmington	0		0	0	2	0	0	1	0	1	17
Winston-Salem	2		0	204	3	4	0	1	0	0	19
South Carolina											
Charleston	0	28	0	0	1	2	0	0	1	7	26
Columbia											
Greenville	0		0	0	2	1	0	0	0	0	12
Georgia											
Atlanta	1	36	0	15	2	2	0	2	0	1	74
Brunswick	0		0	5	0	0	0	0	1	0	5
Savannah	0	3	3	10	2	4	0	4	0	0	35
Florida											
Miami	1		1	0	1	0	0	1	0	6	32
Tampa	7	1	0	0	3	0	0	1	0	0	29
Kentucky											
Ashland	1			0		1	0		0	0	
Lexington	5		0	0	2	4	0	2	1	5	17
Louisville	5	2	0	0	6	10	0	0	0	13	54
Tennessee											
Memphis	3		1	8	5	5	0	3	0	2	85
Nashville	5		0	36	6	11	0	3	0	1	
Alabama											
Birmingham	1	3	0	1	4	2	0	3	1	0	53
Mobile	3		1	1	1	0	0	1	0	0	35
Montgomery	1			4		1	0		0	0	

City reports for week ended Dec 30, 1933—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Arkansas											
Fort Smith	0			1		2	0		0	4	
Little Rock	0		1	6	1	1	0	3	0	0	5
Louisiana											
New Orleans	22		2	0	12	15	0	12	0	0	141
Shreveport	3		0	0	5	2	0	4	0	0	31
Oklahoma											
Tulsa	0			1		1	0		0	2	
Texas											
Dallas	14	1	1	0	2	5	0	6	0	0	58
Fort Worth	5		1	0	6	10	0	1	0	0	52
Galveston	0		0	0	2	4	0	0	0	0	11
Houston	8		0	0	12	2	0	2	0	0	71
San Antonio	2		4	0	12	4	0	3	0	0	83
Montana											
Billings	0		0	0	0	0	0	0	0	0	1
Great Falls	0		0	0	0	0	0	0	0	0	9
Helena	0		0	0	0	0	0	0	0	0	5
Missoula	0	1	0	0	0	0	0	0	0	0	9
Idaho											
Boise	0		0	0	1	0	0	0	0	1	21
Colorado											
Denver	0	33	0	0	7	12	0	7	0	44	73
Pueblo	0		0	1	1	1	0	1	0	3	8
New Mexico											
Albuquerque	0		0	0	0	2	0	5	0	3	13
Utah											
Salt Lake City	0		1	372	3	7	1	0	0	13	34
Nevada											
Reno	0		0	0	0	0	0	0	0	0	4
Washington											
Seattle	0		2	1	11	5	0	3	0	49	104
Spokane	0	1	1	229		3	0	1	0	5	31
Tacoma	0		0	0	2	3	0	0	0	5	30
Oregon											
Portland	5		0	4	5	24	2	2	1	1	70
Salem	0	2	0	0	0	0	0	0	0	0	
California											
Los Angeles	13	30	1	5	21	47	0	16	6	45	267
Sacramento	1		0	4	8	5	0	2	3	0	41
San Francisco	1	2	0	3	7	19	0	7	0	5	165

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Rhode Island:				**Iowa**			
Providence	0	0	1	Waterloo	1	1	0
New York				**Nebraska**			
New York	0	0	1	Omaha	0	0	1
Pennsylvania.				**Maryland**			
Philadelphia	1	0	0	Baltimore	1	0	0
Reading	0	1	0	**North Carolina:**			
Indiana				Winston-Salem	0	0	1
South Bend	0	1	0	**Georgia.**			
Illinois				Atlanta	1	0	0
Chicago	4	1	0	**California**			
Michigan				Los Angeles	1	2	1
Detroit	1	0	0	San Francisco	1	0	0
Minnesota.							
St Paul	0	0	1				

Pellagra.—Cases Charleston, S.C , 2, Savannah, 1.
Typhus fever —Cases. Baltimore, 1, Charleston, S C., 1.
Lethargic encephalitis, St Louis, 1 case

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended December 16, 1933.—During the 2 weeks ended December 16, 1933, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta [1]	British Columbia	Total
Cerebrospinal meningitis					1					1
Chicken pox		17		397	491	276	90		103	1,374
Diphtheria		5	4	61	22	20	2			114
Erysipelas				5	8	2	2		3	20
Influenza		4		19	5	2			33	63
Lethargic encephalitis						1	2			3
Measles				56	18	1	97		5	177
Mumps					161	7	1		59	228
Paratyphoid fever					1					1
Pneumonia		5			46		2		3	56
Poliomyelitis				3	3	1				7
Scarlet fever		14	28	302	341	61	6		117	869
Tuberculosis	7		10	80	89	14	10		31	241
Typhoid fever			1	26	13		4		3	47
Undulant fever				1	2				1	4
Whooping cough		38	2	273	128	56	45		22	564

[1] No report has been received from Alberta for the 2 weeks ended Dec 16, 1933

Quebec Province—Communicable diseases—2 weeks ended December 30, 1933.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended December 30, 1933, as follows.

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Ophthalmia neonatorum	2
Chicken pox	278	Poliomyelitis	1
Diphtheria	35	Puerperal septicemia	2
Erysipelas	11	Scarlet fever	125
German measles	3	Tuberculosis	80
Influenza	12	Typhoid fever	22
Measles	26	Whooping cough	226

CUBA

Habana—Communicable diseases—4 weeks ended December 31, 1933.—During the 4 weeks ended December 31, 1933, certain communicable diseases were reported in Habana, Cuba, as follows

Disease	Cases	Deaths	Disease	Cases	Deaths
Chicken pox	1		Measles	2	
Diphtheria	17	1	Scarlet fever	1	
Leprosy	1		Tuberculosis	13	2
Malaria	57	4	Typhoid fever	6	3

CZECHOSLOVAKIA

Communicable diseases—October 1933—During the month of October 1933, certain communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	2		Paratyphoid fever	32	2
Cerebrospinal meningitis	14	6	Poliomyelitis	14	
Chicken pox	413		Puerperal fever	45	23
Diphtheria	3,084	171	Scarlet fever	3,422	22
Dysentery	14	1	Trachoma	180	
Influenza	41	4	Typhoid fever	621	52
Lethargic encephalitis	2	2	Typhus fever		1
Malaria	194				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Dec 29, 1933, pp 1571-1583 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Jan 26, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands—During the week ended January 6, 1934, cholera was reported in the Philippine Islands as follows. Bohol Province—Antequera, 2 cases, 2 deaths, Calape, 17 cases, 11 deaths; Clarin, 2 cases, 1 death; Cortes, 1 death; Loon, 12 cases, 8 deaths; Lope, 5 cases, 4 deaths, Maribohog, 3 cases, 3 deaths; Tubigon, 37 cases, 29 deaths. Cebu Province—Argao, 2 cases, 2 deaths; Carcar, 5 cases, 3 deaths; Sibonga, 5 cases, 3 deaths Occidental Negros Province—Calatraba, 4 cases, 2 deaths; San Carlos, 4 cases, 3 deaths. Oriental Negros Province—Bais, 6 cases, 5 deaths; Poblacion, 2 cases, 2 deaths; Santa Teresa, 1 case, 1 death; Tanjay, 14 cases, 6 deaths.

Plague

Hawaii Territory—Paauilo.—On December 21, 1933, 1 plague-infected rat was reported in Paauilo, Hamakua district, Island of Hawaii.

Yellow Fever

French West Africa—Guinea.—On December 31, 1933, 2 cases of yellow fever with 2 deaths were reported in Konakri, Guinea, French West Africa.

Ivory Coast—Abengourou.—On December 20, 1933, 1 case of yellow fever with 1 death and 1 suspected case of yellow fever were reported in Abengourou, Ivory Coast.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 4

JANUARY 26 - - - 1934

IN THIS ISSUE

The Occurrence of Tick Parasites in Nature in Idaho
Cities with Milk-Sanitation Ratings of 90 Percent or More
Mortality Summary for a Group of 86 Large Cities, 1933
Deaths in Large Cities During Week Ended January 6
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law. United States Code, title 42, sections 7, 30, 93; title 44, section 220

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

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CONTENTS

	Page
Occurrence of tick parasites in nature in southern Idaho	111
Milk-sanitation ratings of cities—Cities for which milk-sanitation ratings of 90 percent or more have been reported by the milk-sanitation authorities during the period Jan 1, 1932, to Dec. 1, 1933	112
Court decision relating to public health	116
Mortality summary for large cities—Number of deaths, death rates, and infant mortality for a group of 86 large cities in the United States for the 52-week period Jan 1–Dec 30, 1933, and comparison with 1932	117
Deaths during week ended Jan 6, 1934	
Deaths and death rates for a group of large cities in the United States	119
Death claims reported by insurance companies	119

PREVALENCE OF DISEASE

United States:	
Current weekly State reports	
Reports for weeks ended Jan 13, 1934, and Jan 14, 1933	120
Summary of monthly reports from States	122
Weekly reports from cities:	
City reports for week ended Jan 6, 1934	123
Foreign and insular:	
Belgium—Vital statistics—1930, 1931, and 1932	126
Cuba—Provinces—Communicable diseases—4 weeks ended Sept 30, 1933	126
Irish Free State—Vital statistics—Third quarter 1933	126
Jamaica—Communicable diseases—4 weeks ended Dec 30, 1933	127
Puerto Rico—Notifiable diseases—4 weeks ended Dec. 30, 1933	127
Cholera, plague, smallpox, typhus fever, and yellow fever	
Cholera	128
Plague	130
Smallpox	132
Typhus fever	136
Yellow fever	138

PUBLIC HEALTH REPORTS

VOL. 49 JANUARY 26, 1934 NO. 4

OCCURRENCE OF TICK PARASITES IN NATURE IN SOUTHERN IDAHO [1]

By R A. COOLEY, *Entomologist, United States Public Health Service*

Preliminary to releasing parasites (*Hunterellus hookeri* Howard) for the control of the Rocky Mountain wood tick (*Dermacentor andersoni* Stiles) we have been following the practice of making a survey of the region where it is intended to establish colonies. This has been done, primarily, to determine whether naturally established tick parasites are already present, the reared parasites not having been released until the year following that of the survey Such surveys were made in four localities in 1931 and 1932 in Colorado, Idaho, and Oregon. Incidentally, these surveys have also supplied essential information on the tick fauna of the region, particularly with reference to the species present, their relative abundance, host relationships, and seasonal history. The numbers of tick lots collected in each of the several localities concerned were as follows: Conejos Canyon, Conejos County, Colo , 124 lots; Newton's ranch, Alamosa County, Colo., 73 lots; near Mayfield, Ada County, Idaho, 284 lots; near Burns, Harney County, Idaho, 262 lots.

Tick parasites were found in only one of the above areas In animal parasite lot no. 8635 A, taken on a woodchuck trapped on June 28, 1932, near Mayfield, Idaho, by Carl Larson and Roger Cooley, there were 16 larvae, 20 nymphs, and 2 adults of *Ixodes hexagonus* var. *cookei* (Packard). Two of the fed nymphs showed parasitism; and from one, 8 adult parasites emerged. These were determined by A. B. Gahan and Dr. C. F. W. Muesebeck, of the United States National Museum, through Mr. F. C. Bishopp, of the United States Bureau of Entomology, as *Ixodiphagus texanus* Howard.

The finding of this particular parasite in southern Idaho is of considerable interest, since it has not previously been reported subsequent to its discovery in the rabbit tick, *Haemaphysalis leporis-palus-*

[1] Contribution from the Rocky Mountain Spotted Fever Laboratory of the United States Public Health Service at Hamilton, Mont.

tris Packard in 1907. It was described at that time by Howard, the parasitized ticks having been found on a cottontail rabbit in Jackson County, Tex.

All attempts at tick control in this country and all of the biological studies by the writer in controlled thermal cabinets, have been made with *H. hookeri*. This parasite has been reared from ticks many times in various parts of the world—in France, India, Indo-China, Union of South Africa, South West Africa, Nigeria, Brazil, Cuba, and in Florida, Texas, and California in the United States These data include the records for *Ixodiphagus caucurtei* du Buysson, which Gahan has recently shown to be a synonym of *H. hookeri*.

The living strain of *I. texanus* taken from Idaho has been held alive, and several generations have been reared in the Public Health Service Laboratory at Hamilton, Mont So far as we have observed in the rearing of the two parasites in the laboratory, there are no striking biological differences.

MILK-SANITATION RATINGS OF CITIES

Cities for Which Milk-Sanitation Ratings of 90 Percent or More Have Been Reported by the State Milk Sanitation Authorities during the Period January 1, 1932, to December 1, 1933

The accompanying table gives the names of American municipalities for which milk-sanitation ratings of 90 percent or more have been reported by their respective State milk sanitation authorities from January 1, 1932, to December 31, 1933 The primary reason for announcing such ratings from time to time is to encourage the municipalities of the United States to attain and maintain a high level of excellence of the public health control of milk supplies. Another reason is to furnish the traveling public with some means of knowing the cities in which milk sanitation is properly done. It is emphasized, however, that the Public Health Service does not intend to imply that cities not on the list are necessarily doing poor milk control work. Some cities which are doing excellent milk control work are not included because arrangements have not yet been made for the determination of their ratings by the State milk-control authority. In other cases the ratings which have been determined by the State are now more than 2 years old and have therefore lapsed.

The rules under which a municipality is included in this list and in subsequent similar lists are as follows:

(1) All ratings must have been determined in accordance with the Public Health Service rating method, based upon the edition of the Public Health Service Milk Ordinance and Code current at the time of the rating.

(2) No city will be included in the list unless both its pasteurized milk and its raw milk ratings are 90 percent or more; provided, that cities in which only raw milk is sold will be included if the raw milk ratings are 90 percent or more.

(3) The rating published will be the latest rating submitted to the Public Health Service, but no rating will be published which is more than 2 years old.

(4) Additional supplementary lists of ratings will be published monthly, and complete revisions of the entire list semiannually.

(5) Occasional surprise checks will be made of the rating methods used by the State, and discounts will be applied if State ratings are found to be more than 5 percent too high.

(6) Ratings will be accepted for any city irrespective of the type of milk ordinance in force, provided that the ratings have been made in accordance with paragraph (1) above.

Cities included in the list presented here are urgently advised to bring their milk sanitation status to the level required by the 1933 code, since this edition will be used for ratings made in 1934. It is also urged that cities now on the list do not permit their ratings to lapse, as ratings more than 2 years old cannot be used.

Cities which are not now on the list should improve their milk supplies as much as possible and then request the State milk control authority to determine their ratings. Where the Public Health Service Milk Ordinance has not as yet been adopted, thoughtful consideration should be given to the advisability of its adoption, for the reason that the standard rating method is based upon the Grade A requirements of the Public Health Service Milk Ordinance, and it is obviously easier to satisfy these requirements if they are included in the local legislation. Copies of the Public Health Service Milk Ordinance and Code are available upon request.

State milk-control authorities which are not now equipped to determine municipal milk sanitation ratings are urged to so equip themselves as soon as possible in fairness to their cities. The personnel required is very small, as in most States one milk specialist will be sufficient for the rating work. The Public Health Service will, upon request from the State milk control authority, furnish assistance in standardizing the rating work.

Cities which are enforcing the Public Health Service Milk Ordinance and which have nevertheless failed to achieve ratings of 90 percent or more, should determine whether their low ratings resulted from failure to enforce the ordinance strictly, or from failure to bring their ordinance up to date with the latest revision in force at the time of the rating.

The ratings included in the accompanying table apply only to market milk. Family cow milk is not included, and consumers should,

therefore, not infer that the milk from neighborhood cows in such cities is of a high grade

The first column of the table gives the rating of the pasteurized milk, the second column the rating of the raw milk, the third column the percentage of milk pasteurized, and the fourth column the date of completion of the rating.

A pasteurized milk rating of 90 percent means that the pasteurized milk sold in the city in question is of such a degree of excellence that the weighted average of the percentages of compliance with the various items of sanitation required for grade A pasteurized milk is 90 percent Similarly, a raw milk rating of 90 percent means that the raw milk sold in the city in question is of such a degree of excellence that the weighted average of the percentages of compliance with the various items of sanitation required for grade A raw milk is 90 percent.

Cities having ratings of 90 percent or more according to last rating received during period Jan 1, 1932, to Dec 31, 1933

City	Pasteurized milk rating	Raw milk rating	Percentage of milk pasteurized	Date of rating
ALABAMA (27 cities)				
Andalusia		92	0	June 22, 1932
Athens		95	0	June 15, 1932
Atmore		93	0	Aug 22, 1932
Auburn		94	0	July 7, 1932
Boaz		94	0	June 29, 1932
Cullman	99	92	28	Sept 23, 1932
Decatur	94	90	44	Aug 19, 1932
Flomaton		96	0	Aug 22, 1932
Florence	92	90	35	July 7, 1932
Fort Payne		94	0	Oct 7, 1932
Gadsden	99	95	24	Do
Guntersville		91	0	June 29, 1932
Hartselle		96	0	Aug 17, 1932
Huntsville	97	93	53	July 20, 1932
Montgomery	96	90	22	Aug 26, 1932
Opelika	91	92	21	July 6, 1932
Russellville		93	0	Aug 22, 1932
Scottsboro		96	0	June 27, 1932
Selma		93	0	Aug 2, 1932
Stevenson		96	0	June 27, 1932
Sylacauga		93	0	Aug 2, 1932
Talladega		92	0	Do.
Tallassee		98	0	Feb 5, 1932
Tuscaloosa	97	95	75	July 28, 1932
Tuskegee	98	92	52	July 5, 1932
Wetumpka		90	0	Sept 20, 1932
York		97	0	Aug 23, 1932
ARKANSAS (1 city)				
Texarkana	98	96	33	Oct 13, 1932
INDIANA (1 city)				
Frankfort	93		100	Mar 11, 1933
KENTUCKY (3 cities)				
Bowling Green	92	91	22	Aug 1933
Henderson	98	97	29	June 1933
Louisville	95	99 5	97	Sept. 1933

Cities having ratings of 90 percent or more according to last rating received during period Jan 1, 1932, to Dec 31, 1933—Continued

City	Pasteurized milk rating	Raw milk rating	Percentage of milk pasteurized	Date of rating
MISSISSIPPI (18 cities)				
Brookhaven	-----------	99	0	May 18, 1933
Cleveland	96	98	41	July 20, 1933
Columbus	99	96	59	July 12, 1933
Durant	-----------	99	0	May 22, 1933
Greenville	97	95	13	May 31, 1933
Greenwood	98	92	23	July 14, 1933
Hollandale	-----------	95	0	June 1, 1933
Indianola	-----------	92	0	June 2, 1933
Jackson	93	90	22	Aug 11, 1933
McComb	-----------	94	0	June 21, 1933
Meridian	99	99	22	May 4, 1933
Natchez	92	96	16	May 17, 1933
Ocean Springs	-----------	92	0	July 7, 1933
Picayune	91	94	76	June 8, 1933
Ruleville	-----------	98	0	June 2, 1933
Shelby	92	95	63	June 10, 1932
Vicksburg	96	92	35	June 28, 1933
Yazoo City	-----------	95	0	May 24, 1933
NEW MEXICO (4 cities)				
Alamogordo	-----------	94	0	May 20, 1933
Artesia	-----------	90	0	May 23, 1933
Clayton	-----------	90	0	June 3, 1933
Las Vegas	90	-----------	100	Sept 8, 1932
NORTH CAROLINA (24 cities)				
Albemarle	-----------	92	0	Oct 31, 1933
Apex	-----------	97	0	Sept 28, 1933
Beaufort	-----------	96	0	July 15, 1933
Canton	-----------	98	0	Oct 19, 1933
Coats	-----------	97	0	Oct 10, 1933
Dunn	-----------	95	0	Do
Durham	96	92	76	Nov. 10, 1932
Elkin	-----------	93	0	Oct 6, 1932
Erwin	-----------	95	0	Oct 10, 1933
Granite Falls	-----------	92	0	Oct 5, 1933
Hamlet	-----------	95	0	Oct 20, 1933
Hendersonville	93	97	35	Oct. 3, 1933
High Point	94	95	60	Oct 21, 1933
Hope Mills	-----------	99 5	0	Oct 13, 1933
Lenoir	-----------	95	0	Oct 4, 1933
Manteo	-----------	94	0	Sept 19, 1933
Morehead City	-----------	93	0	July 15, 1933
Mt Airy	-----------	99	0	Oct. 6, 1933
Rockingham	-----------	93	0	Oct 19, 1933
Sanford	-----------	92	0	Oct 28, 1932
Thomasville	93	90	30	Sept 11, 1933
Waynesville	-----------	96	0	Oct 21, 1933
Wilkesboro	-----------	93	0	Nov 21, 1932
Winston-Salem	94	92	42	Sept 30, 1933
OREGON (1 city)				
Portland	93	98	76	Dec 2, 1932
SOUTH CAROLINA (1 city)				
Columbia	91	92	60	1932

Cities having ratings of 90 percent or more according to last rating received during period Jan 1, 1932, to Dec 31, 1933—Continued

City	Pasteurized milk rating	Raw milk rating	Percentage of milk pasteurized	Date of rating
TENNESSEE (3 cities)				
Covington		91	0	Nov 2, 1932
Dyersburg		90	0	June 1, 1933
Memphis	90	98	73	July 1933
TEXAS (12 cities)				
Abilene	95	95	51	June 15, 1932
Amarillo	90	94	63	May 14, 1932
Austin	92	95	21	Sept 12, 1932
Brenham		93	0	Apr 1932
Dallas	93	93	78	June 1932
Graham	95	92	28	Do
Jacksonville		92	0	Nov 1932
La Feria		91	0	Jan 27, 1932
Lubbock	90	91	17	Mar 3, 1932
Sweetwater	93	96	74	June 27, 1932
Texarkana	95	93	36	Apr 1932
Waco	91	91	32	Dec 9, 1932
WASHINGTON (2 cities)				
Vancouver	90	93	25	Nov 30, 1932
Walla Walla	93	94	56	Dec 14, 1932

COURT DECISION RELATING TO PUBLIC HEALTH

Original birth certificate held admissible in evidence.—(Missouri Supreme Court, Div. No. 2; *State* v. *Shelby*, 62 S W (2d) 721; decided Aug 12, 1933) In a criminal case the State introduced in evidence the original birth certificate of the prosecuting witness. It was urged that it was error for the court to admit such certificate because it appeared from the assistant State registrar's testimony, as well as from the instrument itself, that the child's name was not written therein by the attending physician, but that it was written with a different ink, by a different hand, and at a time subsequent to the filling in of the other parts of the blank. The evidence strongly tended to show that the child's name was written in the same handwriting and with the same ink as the local registrar's signature. By State law the certificate was required to be preserved, and one part of the law detailed the procedure to be followed if the child had not been named at the date of filing the birth certificate. The supreme court said that it seemed to it, under the facts outlined and in view of the statutory provisions, that the trial court, in the absence of evidence to the contrary, might properly have indulged the presumption of right acting and performance of duty by officials charged with the enforcement of the law governing the registration of vital statistics with respect to the certificate in question and admitted it on that ground.

But the court said that there was another and more compelling reason why the action of the trial court in admitting the certificate was proper. By statute it was provided that a properly certified copy of the record of any birth registered under the law should be prima facie evidence in all courts and places of the facts therein stated. Reference was made by the court to the recent case of *State* v *Worden*, 56 S W (2d) 595, 598, in which it was said.

Since original [birth] certificates * * * are required by the statute * * * to be permanently kept, such a certificate becomes an official record which is always admissible in evidence. A copy of a public paper required to be filed, certified by the officer intrusted with its custody, is admissible in evidence if the original is admissible * * *

The court stated that it necessarily followed that the converse of the latter proposition was true, that is, if the certified copy was admissible, the original was certainly likewise admissible Said the court:

* * * It would be anomalous, indeed, to hold inadmissible an original document a certified copy of which is by statute made prima facie evidence, and we decline to so hold

MORTALITY SUMMARY FOR LARGE CITIES, 1933

Number of deaths, death rates, and infant mortality for a group of 86 large cities in the United States for the 52-week period Jan 1 to Dec 30, 1933, and comparison with 1932

[From the Weekly Health Index, Bureau of the Census, Department of Commerce]

City	Total deaths [1]	Death rate [2] (per 1,000 estimated population)	Deaths under 1 year [1]	Provisional infant mortality rate 1933 [1,3]	Infant mortality rate 1932	Actual mortality in calendar year, 1932		
						Total deaths	Death rate [4] (per 1,000 estimated population)	Deaths under 1 year
Total (86 cities)	408,972	11 0	29,776	53	55	413,958	11.2	32,847
Akron	1,970	7 3	152	43	46	1,985	7 5	183
Albany	1,835	14 0	104	43	49	1,765	13 5	118
Atlanta	3,935	13 6	415	82	69	3,879	13 7	375
White	2,021	10 6	201	64	56	2,049	10 9	194
Colored	1,914	19 5	214	113	92	1,830	19.1	181
Baltimore	10,785	13 1	824	61	62	10,775	13 1	870
White	8,230	12 2	546	53	53	8,063	12 0	572
Colored	2,555	16 7	278	87	94	2,712	18 1	298
Birmingham	3,100	10 9	310	70	65	3,211	11.6	322
White	1,541	8 7	140	57	49	1,553	9 0	143
Colored	1,559	14 4	170	86	87	1,658	15 7	179
Boston	10,988	13 9	938	58	59	10,924	13 9	1,024
Bridgeport	1,591	10 8	100	43	47	1,530	10 4	122
Buffalo	7,104	12 0	661	68	67	7,258	12.4	692
Cambridge	1,401	12 2	104	42	57	1,384	12.1	140
Camden	1,526	12 8	160	57	68	1,714	14.4	208
Canton	924	8 4	60	40	69	1,004	9 3	109
Chicago	34 632	9 7	2,270	51	49	34,360	9 8	2,415
Cincinnati	6 531	14 0	400	56	55	6,781	14.7	413
Cleveland	9 093	9 8	585	43	53	9,821	10 6	797
Columbus	4.013	13 3	304	64	61	4,096	13 7	285
Dallas	3,154	10 8	390	78	79	3,044	10 8	392
White	2 422	9 8	329	78	69	2,204	9 2	268
Colored	732	17 0	61	77	121	840	20.0	124

See footnotes at end of table.

Number of deaths, death rates, and infant mortality for a group of 86 large cities in the United States for the 52-week period Jan 1 to Dec 30, 1933, and comparison with 1932—Continued

City	Total deaths [1]	Death rate [2] (per 1,000 estimated population)	Deaths under 1 year [1]	Provisional infant mortality rate 1933 [2,3]	Infant mortality rate 1932	Actual mortality in calendar year, 1932: Total deaths	Death rate [4] (per 1,000 estimated population)	Deaths under 1 year
Dayton	2,424	11.6	156	50	54	2,428	11.7	181
Denver	3,982	13.4	254	52	69	4,326	14.7	336
Des Moines	1,501	10.2	83	30	57	1,798	12.3	150
Detroit	12,340	6.9	1,160	51	52	12,990	7.5	1,349
Duluth	1,031	10.1	67	41	52	1,149	11.3	84
El Paso	1,441	13.2	314	126	92	1,462	13.7	238
Erie	1,253	10.4	81	33	54	1,311	11.0	119
Evansville	1,145	10.7	86	62	44	1,114	10.5	64
Fall River [5]	1,562	13.6	119	57	53	1,312	11.4	111
Flint	1,301	7.4	169	56	61	1,227	7.2	200
Fort Wayne	1,190	9.6	50	26	49	1,199	9.9	89
Fort Worth	1,788	10.3	177	70	66	1,765	10.3	178
White	1,420	9.4	137	62	58	1,361	9.2	129
Colored	368	15.9	40	130	106	404	17.6	49
Grand Rapids	1,605	9.1	138	52	40	1,545	8.9	117
Hartford	2,135	12.4	190	78	54	2,034	12.0	201
Houston	3,564	10.5	308	61	62	3,479	10.7	321
White	2,501	9.4	229	56	39	2,149	8.4	148
Colored	1,063	14.8	79	79	127	1,330	19.1	173
Indianapolis	4,851	12.8	319	59	61	4,760	12.7	365
White	4,096	12.4	261	55	58	4,011	12.2	299
Colored	755	16.1	58	82	83	749	16.2	66
Jersey City	3,429	10.7	280	41	54	3,537	11.0	363
Kansas City, Kans	1,533	12.3	104	47	59	1,587	12.8	134
White	1,175	11.4	67	34	54	1,264	12.3	103
Colored	358	16.7	37	147	89	323	15.4	31
Kansas City, Mo	5,124	12.1	292	53	57	5,131	12.3	331
Knoxville	1,295	11.3	144	70	75	1,343	12.0	158
White	1,027	10.8	109	59	71	1,046	11.2	135
Colored	268	14.1	35	150	104	297	16.2	23
Long Beach	1,464	8.7	66	30	36	1,534	9.5	72
Los Angeles	14,657	10.1	874	55	56	14,712	10.6	944
Louisville	3,849	12.5	307	58	67	4,295	13.9	355
White	2,887	11.1	242	54	61	3,317	12.7	278
Colored	962	20.1	65	74	102	978	20.5	77
Lowell [5]	1,326	13.3	102	57	67	1,298	12.9	130
Lynn	1,023	9.9	64	39	42	1,039	10.1	66
Memphis	4,289	16.0	437	104	96	4,344	16.5	442
White	2,121	12.8	215	85	76	2,169	13.3	213
Colored	2,168	21.2	222	134	127	2,175	21.6	229
Miami	1,231	11.2	86	53	58	1,242	11.4	102
White	854	9.9	53	45	45	866	10.2	58
Colored	377	15.6	33	74	91	376	15.5	44
Milwaukee	4,893	8.0	387	45	47	5,210	8.6	442
Minneapolis	5,015	10.3	303	42	53	5,187	10.8	421
Nashville	2,386	15.1	256	81	78	2,412	15.4	261
White	1,551	13.5	173	75	77	1,561	13.7	193
Colored	835	19.5	83	98	81	818	19.8	68
New Bedford [5]	1,324	11.8	90	55	56	1,244	11.0	97
New Haven	2,090	12.9	95	43	43	2,039	12.5	134
New Orleans	7,483	15.6	683	84	75	7,750	16.3	685
White	4,400	12.9	339	68	61	4,685	13.9	351
Colored	3,083	22.2	344	108	99	3,065	22.4	331
New York	75,157	10.3	5,511	52	51	74,501	10.3	5,598
Bronx Borough	11,044	7.7	730	47	41	10,619	7.7	682
Brooklyn Borough	25,793	9.5	2,094	48	47	25,428	9.5	2,096
Manhattan Borough	27,951	16.2	2,067	63	63	28,182	15.9	2,160
Queens Borough	8,078	6.4	488	44	42	7,964	6.6	509
Richmond Borough	2,291	13.4	132	52	58	2,308	13.8	151
Newark, N J	4,927	11.0	328	41	41	4,670	10.4	361
Oakland	3,098	10.2	144	37	40	3,130	10.5	159
Oklahoma City	2,060	9.6	226	63	64	2,091	10.2	210
Omaha	2,681	12.2	165	39	42	2,720	12.4	178
Paterson	1,711	12.3	120	45	49	1,721	12.4	138
Peoria	1,156	10.2	80	50	56	1,199	10.8	94
Philadelphia	23,785	12.0	1,450	49	52	23,743	12.0	1,668
Pittsburgh	7,447	10.9	639	54	66	8,647	12.7	867
Portland, Oreg	3,510	11.2	134	35	34	3,422	11.0	133
Providence	3,121	12.1	265	54	60	3,312	12.9	312

See footnotes at end of table

Number of deaths, death rates, and infant mortality for a group of 86 large cities in the United States for the 52-week period Jan 1 to Dec 30, 1933, and comparison with 1932—Continued

City	Total deaths [1]	Death rate [2] (per 1,000 estimated population)	Deaths under 1 year [1]	Provisional infant mortality rate 1933 [2 3]	Infant mortality rate 1932	Actual mortality in calendar year, 1932		
						Total deaths	Death rate [4] (per 1,000 estimated population)	Deaths under 1 year
Richmond	2,529	13 6	189	62	64	2,616	14 1	216
White	1,522	11 4	96	51	49	1,544	11 6	109
Colored	1,007	19 2	93	81	90	1,072	20 3	107
Rochester	3,771	11 2	249	51	48	3,888	11 6	260
St Louis	10,562	12 6	529	41	56	11,035	13 3	724
St Paul	2,804	9 9	182	41	39	2,983	10 7	195
Salt Lake City	1,496	10 2	139	44	42	1,585	10 9	136
San Antonio	3 306	13 1	537	100	103	3,454	14 0	530
San Diego	2,233	13 2	128	49	47	2,252	13 8	122
San Francisco	8,208	12 2	274	40	39	8,224	12 4	293
Schenectady	1,039	10 8	65	46	54	981	10 2	81
Seattle	4,142	10 9	164	34	43	4,153	11 0	212
Somerville	973	9 1	62	51	47	930	8 7	63
South Bend	833	7 3	57	39	50	836	7 5	75
Spokane	1,375	11 7	72	37	40	1,342	11 5	77
Springfield, Mass	1,721	11 0	120	44	57	1,683	10 9	150
Syracuse	2,398	11 0	139	39	49	2,521	11 7	187
Tacoma	1,394	12 8	53	28	48	1,380	12 7	84
Tampa	1,226	11 1	83	54	52	1,182	10 9	89
White	852	9 7	60	48	42	878	10 3	57
Colored	374	16 1	23	81	89	304	13 4	32
Toledo	3,434	11 3	236	56	62	3,444	11 4	272
Trenton	1,835	14 8	115	48	58	1,754	14 1	146
Utica	1,432	13 9	92	53	60	1,526	14 8	110
Washington, D C	7,885	16 0	659	66	73	7,937	16 1	740
White	4,791	13 4	318	48	56	5,001	14 0	380
Colored	3,094	22 6	341	99	108	2,936	21 6	360
Waterbury	919	9 0	74	55	43	1,040	10 2	80
Wilmington, Del [5]	1,529	14 4	103	47	62	1,490	14.0	136
Worcester	2,471	12 4	164	51	53	2,379	12 0	181
Yonkers	1,082	7 5	86	50	46	1,194	8 4	90
Youngstown	1,613	9 1	125	49	62	1,659	9 5	175

[1] Based upon telegraphic reports received each week from city health officers

[2] Allowance has been made for the extra day which must be added to the 52 weeks to give a period of 365 days

[3] Infant mortality rate is based upon deaths under 1 year as returned each week, and estimated live births, 1933

[4] Based upon deaths which occurred within the calendar year

[5] Mortality rates based upon population Apr 1, 1930, decreased 1920 to 1930, no estimate made

NOTE —For the cities for which deaths are shown by color, the percentages of colored population in 1930 were as follows Atlanta, 33, Baltimore 18, Birmingham 38, Dallas 17, Fort Worth 16, Houston 27, Indianapolis 12, Kansas City, Kans 19, Knoxville 16, Louisville 15, Memphis 38, Miami 23, Nashville 28, New Orleans 29, Richmond 29, Tampa 21, and Washington, D C. 27

DEATHS DURING WEEK ENDED JAN. 6, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Jan 6, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	9,344	9,776
Deaths per 1,000 population, annual basis	13 0	13 6
Deaths under 1 year of age	630	676
Deaths under 1 year of age per 1,000 estimated live births	59	[1] 57
Data from industrial insurance companies		
Policies in force	67,833,275	69,164,524
Number of death claims	10,178	11,377
Death claims per 1,000 policies in force, annual rate	7 8	8.6

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Jan. 13, 1934, and Jan. 14, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan 13, 1934, and Jan. 14, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933
New England States								
Maine	1	1	9	1,341	5		0	0
New Hampshire	1				85		0	0
Vermont	3	3			33		0	0
Massachusetts	20	22		263	1,209	140	2	0
Rhode Island	1	4		79	2	1	1	0
Connecticut	7	5	12	471	10	100	0	0
Middle Atlantic States:								
New York	54	69	[1] 16	[1] 533	652	1,160	5	11
New Jersey	27	39	26	444	110	308	1	1
Pennsylvania	84	111			946	360	4	2
East North Central States:								
Ohio	75	62	100	870	239	559	1	3
Indiana	41	46	75	452	170	16	9	4
Illinois	60	86	19	245	147	77	10	0
Michigan	14	23	7	173	46	378	0	5
Wisconsin	9	10	49	4,943	157	158	2	3
West North Central States:								
Minnesota	11	6	1	88	97	224	0	2
Iowa [3]	13	22	15	1,208	63		0	5
Missouri	73	46	7	104	433	79	1	4
North Dakota		8	5	2,470	134	65	0	0
South Dakota	5	12	1	148	340	5	1	0
Nebraska	12	14		216	17	9	0	3
Kansas	20	10	1	2,027	29	25	2	2
South Atlantic States:								
Delaware	5	11	3	13	12	2	0	0
Maryland [3]	16	15	26	1,235	51	6	0	2
District of Columbia	13	10	5	11	101	7	0	1
Virginia	43	22			309	176	4	5
West Virginia	23	12	39	2,094	17	228	0	1
North Carolina [3]	51	17	49	1,193	1,382	144	0	1
South Carolina	15	10	684	3,016	334	20	0	0
Georgia [4]	12	12		1,507	849	4	0	0
Florida [4]	14	9	3	84	11	4	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan 13, 1934, and Jan 14, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus Meningitis	
	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933
East South Central States								
Kentucky	20	34	7	4,134	7		2	3
Tennessee	26	23	70	1,630	437	9	2	4
Alabama [4]	33	30	50	1,119	137	4	2	5
Mississippi [2]	14	10					0	0
West South Central States								
Arkansas	9	13	65	1,187	681	6	0	0
Louisiana	21	22	16	560	22	2	3	2
Oklahoma [5]	39	21	72	1,410	232		2	3
Texas [4]	232	108	1,262	3,054	1,135	543	4	1
Mountain States								
Montana	1	6	4	2,250	4	194	0	0
Idaho			3	3	24	6	0	0
Wyoming		2			41	20	0	0
Colorado	5	11		108	11	10	0	0
New Mexico	8	12	3	4	124	3	0	0
Arizona	2	3	21	51	16		4	0
Utah [2]	1	2		5	606		0	0
Pacific States								
Washington	3	4		58	400	3	0	0
Oregon	2	3	31	527	27	25	0	0
California	48	61	48	756	635	108	3	5
Total	1,187	1,082	2,804	42,084	12,529	5,188	65	87

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933
New England States								
Maine	2	0	19	45	0	0	1	0
New Hampshire	0	0	35	26	0	0	0	0
Vermont	0	0	12	17	0	0	0	0
Massachusetts	1	0	260	416	0	0	3	3
Rhode Island	0	0	23	41	0	0	0	0
Connecticut	0	0	62	114	0	1	0	1
Middle Atlantic States								
New York	2	0	687	747	0	0	7	7
New Jersey	0	1	165	265	0	0	5	1
Pennsylvania	0	2	709	594	0	0	13	6
East North Central States								
Ohio	0	1	554	682	0	7	2	4
Indiana	0	0	188	108	2	2	0	1
Illinois	0	1	528	488	3	12	7	2
Michigan	2	0	335	408	1	0	1	3
Wisconsin	0	0	137	101	18	4	0	0
West North Central States								
Minnesota	1	0	66	94	1	2	1	0
Iowa [2]	0	0	72	30	2	16	0	0
Missouri	1	0	147	118	2	0	3	2
North Dakota	0	0	10	3	1	1	2	0
South Dakota	0	0	18	19	1	0	2	32
Nebraska	0	0	39	22	2	2	0	0
Kansas	0	0	121	73	4	1	3	1
South Atlantic States								
Delaware	1	0	12	15	0	0	1	0
Maryland [3]	0	1	110	101	0	0	5	1
District of Columbia	0	0	16	21	0	0	1	0
Virginia	0	0	123	66	0	0	5	1
West Virginia	1	0	67	47	0	0	5	3
North Carolina [3]	0	0	115	65	0	2	2	1
South Carolina	3	0	9	8	0	1	6	2
Georgia [4]	0	0	14	17	0	0	7	3
Florida [4]	0	0	8	8	0	0	2	4

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 13, 1934, and Jan. 14, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933	Week ended Jan 13, 1934	Week ended Jan 14, 1933
East South Central States								
Kentucky	0	3	66	35	1	0	2	3
Tennessee	0	0	72	44	0	2	9	6
Alabama [4]	1	1	24	22	1	2	3	8
Mississippi [2]	1	0	13	7	0	2	0	0
West South Central States								
Arkansas	0	0	13	9	2	12	5	1
Louisiana	0	0	28	16	5	5	9	5
Oklahoma [5]	0	1	24	49	0	2	2	4
Texas [4]	0	0	249	113	6	15	21	8
Mountain States								
Montana	0	0	16	16	0	0	0	0
Idaho	0	0	6	7	0	4	2	1
Wyoming	0	0	18	18	2	1	1	0
Colorado	0	0	14	23	3	0	0	1
New Mexico	0	0	34	14	0	0	4	3
Arizona	2	0	22	10	0	1	0	0
Utah [2]	0	0	10	14	1	1	0	0
Pacific States								
Washington	5	1	36	28	8	5	0	3
Oregon	0	0	60	16	8	1	0	0
California	8	1	343	174	6	24	11	6
Total	31	13	5,709	5,374	80	128	153	127

[1] New York City only
[2] Week ended earlier than Saturday
[3] Rocky Mountain spotted fever, week ended Jan 13, 1934, North Carolina, 1 case
[4] Typhus fever, week ended Jan 13, 1934, 33 cases, as follows Georgia, 14, Florida, 1, Alabama, 3; Texas, 15
[5] Exclusive of Oklahoma City and Tulsa

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December 1933										
District of Columbia	3	52	9		125	1	2	75	0	0
Florida	1	57	9	33	39	1	1	16	0	8
New Jersey	5	101	97		333		2	580	0	17
New York	16	273		6	3,297		24	2,090	1	42
North Dakota	3	25			125		0	137	0	9
Ohio	7	291	207	3	486		9	2,120	5	22
Vermont		4			297		0	69	0	3

December 1933

	Cases
Anthrax.	
New York	1
Chicken pox.	
District of Columbia	44
Florida	61
New Jersey	1,283
New York	3,584
North Dakota	182
Ohio	2,516
Vermont	226
Diarrhea and enteritis:	
Ohio (under 2 years)	22
Dysentery	
Florida	5
New Jersey (amoebic)	6
New York (amoebic)	11
New York (bacillary)	25
North Dakota	5
Ohio	19
Food poisoning.	
Ohio	10
German measles	
New Jersey	18
New York	104
Ohio	120
Lead poisoning	
New Jersey	1
Ohio	5
Lethargic encephalitis:	
New York	5
North Dakota	1
Ohio	2
Mumps:	
Florida	4
New Jersey	160
North Dakota	4
Ohio	108
Vermont	78

	Cases
Ophthalmia neonatorum	
New Jersey	1
New York	2
Ohio	71
Paratyphoid fever	
New Jersey	1
New York	3
Ohio	1
Puerperal septicemia	
Ohio	3
Rabies in animals	
New Jersey	11
New York [1]	1
Septic sore throat	
New York	31
Ohio	226
Tetanus	
New York	6
Ohio	3
Trachoma	
Ohio	5
Trichinosis	
New Jersey	10
New York	19
Ohio	1
Tularaemia	
Ohio	37
Typhus fever	
Florida	1
New York	1
Undulant fever	
Florida	1
New Jersey	4
New York	23
Ohio	1
Vincent's infection	
New York [1]	79
Whooping cough	
District of Columbia	70
Florida	11
New Jersey	485
New York	1,656
North Dakota	36
Ohio	914
Vermont	257

[1] Exclusive of New York City

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan 6, 1934

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	3	1	0	0	0	10	18
New Hampshire											
Concord	0	------	0	1	0	0	0	0	0	0	10
Manchester	0	------	1	0	2	1	0	0	0	0	15
Nashua	0	------	0	1	0	3	0	0	0	0	------
Vermont											
Barre	0	------	0	8	1	0	0	0	0	0	3
Burlington	0	------	0	0	0	4	0	0	0	7	8
Massachusetts											
Boston	3	------	2	234	35	42	0	10	0	27	264
Fall River	0	------	0	0	2	2	0	0	0	2	30
Springfield	0	------	0	1	3	1	0	0	0	12	44
Worcester	0	------	0	256	6	11	0	1	0	0	58
Rhode Island											
Pawtucket	1	------	0	0	0	2	0	0	0	0	12
Providence	0	------	0	0	15	6	0	2	0	7	81
Connecticut											
Bridgeport	0	2	2	6	6	7	0	2	0	5	48
Hartford	0	1	0	0	3	4	0	0	0	1	49
New Haven	0	4	0	0	5	0	0	0	0	1	33
New York:											
Buffalo	2	------	1	168	23	15	0	5	0	13	152
New York	38	26	14	20	189	202	0	83	3	93	1,653
Rochester	1	------	0	0	7	9	0	1	0	6	86
Syracuse	0	------	0	0	12	8	0	0	0	25	55
New Jersey											
Camden	0	------	1	18	4	9	0	1	0	0	44
Newark	0	9	0	3	9	12	0	4	1	15	109
Trenton	0	------	0	2	5	5	0	0	0	1	29
Pennsylvania											
Philadelphia	2	12	9	304	51	57	0	28	0	43	567
Pittsburgh	15	5	4	11	20	29	0	9	1	23	187
Reading	1	------	1	2	3	4	0	1	0	4	28
Scranton	0	------	0	1	0	6	0	0	0	4	------
Ohio:											
Cincinnati	8	2	0	262	17	28	0	10	0	13	161
Cleveland	10	41	5	0	38	51	0	9	0	73	221
Columbus	0	------	0	2	6	19	0	4	0	0	99
Toledo	0	1	1	67	10	26	0	1	0	7	89
Indiana											
Fort Wayne	2	------	0	1	1	7	0	1	0	0	21
Indianapolis	3	------	0	5	18	12	0	3	0	19	------
South Bend	0	------	1	0	2	1	0	0	0	0	17
Terre Haute	0	------	1	29	3	2	0	0	0	0	14
Illinois:											
Chicago	2	3	4	18	64	162	0	36	1	126	786
Springfield	0	------	0	0	1	0	0	0	0	8	23
Michigan:											
Detroit	8	7	1	6	28	80	0	12	0	71	248
Flint	1	------	0	0	5	26	0	1	1	0	31
Grand Rapids	1	------	0	2	6	2	0	0	0	0	24
Wisconsin											
Kenosha	0	------	0	0	0	16	0	0	0	5	8
Milwaukee	2	3	3	1	9	11	0	1	0	58	98
Racine	0	------	0	0	0	10	0	1	0	6	16
Superior	0	------	0	0	2	0	0	0	0	2	18

City reports for week ended Jan 6, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Minnesota											
Duluth	0	------	0	0	5	0	0	2	0	0	25
Minneapolis	3	------	0	3	16	15	0	0	0	3	114
St Paul	0	5	5	1	10	7	1	1	2	14	67
Iowa											
Des Moines	1	------	------	0	------	19	0	------	0	0	38
Sioux City	4	------	------	0	------	0	0	------	0	0	2
Waterloo	0	------	------	24	------	1	0	------	0	1	------
Missouri											
Kansas City	5	------	1	1	27	36	0	7	0	9	150
St Joseph	0	------	0	0	9	2	0	1	1	0	33
St Louis	29	1	1	266	27	19	0	6	1	35	232
North Dakota											
Fargo	0	------	0	91	2	0	0	0	0	0	8
Grand Forks	0	------	0	0	0	0	0	0	0	0	------
South Dakota											
Sioux Falls	0	------	0	101	0	0	0	0	0	0	7
Nebraska											
Omaha	1	------	0	29	12	7	2	0	0	11	54
Kansas											
Topeka	0	------	0	0	0	2	0	0	0	6	3
Wichita	1	------	0	0	2	6	0	4	0	4	41
Delaware											
Wilmington	2	------	0	3	6	3	0	0	0	2	38
Maryland											
Baltimore	1	18	3	2	32	31	0	16	0	55	266
Cumberland	2	------	0	0	2	4	0	0	0	1	6
Frederick	0	------	0	0	0	3	0	0	0	0	8
District of Columbia											
Washington	8	1	0	60	18	13	0	10	0	7	182
Virginia											
Lynchburg	7	------	0	0	0	4	0	0	1	0	11
Richmond	0	------	1	1	3	6	0	1	0	0	57
Roanoke	2	------	0	0	2	5	0	0	0	1	15
West Virginia											
Charleston	2	1	0	0	1	0	0	0	0	0	13
Huntington	0	------	0	0	8	0	0	0	0	0	------
Wheeling	0	------	------	1	------	6	0	------	0	7	------
North Carolina											
Raleigh	0	------	1	0	1	1	0	0	0	5	17
Wilmington	0	------	0	1	0	0	0	0	0	1	7
Winston-Salem	4	2	0	318	1	4	0	0	0	1	12
South Carolina											
Charleston	0	9	0	0	4	0	0	0	0	0	24
Columbia	0	------	0	0	1	0	0	0	0	0	6
Greenville	0	------	0	0	3	0	0	1	0	0	34
Georgia											
Atlanta	4	33	2	39	14	6	0	5	0	2	92
Brunswick	0	------	0	10	0	0	0	0	0	0	2
Savannah	0	15	0	10	4	1	0	1	0	0	32
Florida											
Miami	0	------	0	0	0	0	0	1	0	3	24
Tampa	4	------	0	0	3	1	0	3	0	0	30
Kentucky											
Ashland	1	4	------	0	------	2	0	------	0	0	------
Lexington	0	------	0	0	1	0	0	2	0	0	21
Louisville	5	------	0	0	14	24	0	1	0	7	78
Tennessee											
Memphis	7	------	0	18	12	7	0	3	0	0	88
Nashville	0	------	1	45	4	3	0	3	1	4	45
Alabama											
Birmingham	4	2	1	1	6	6	0	5	0	0	67
Mobile	0	------	0	1	8	0	0	2	0	0	22
Montgomery	3	2	------	7	------	0	0	------	0	5	------
Arkansas											
Fort Smith	0	------	------	9	------	0	0	------	0	0	------
Little Rock	1	------	0	33	5	0	0	1	0	0	7
Louisiana											
New Orleans	12	5	4	5	13	3	0	14	0	1	159
Shreveport	2	------	0	0	0	2	0	5	0	0	27
Oklahoma:											
Tulsa	2	------	------	3	------	0	0	------	0	2	------
Texas.											
Dallas	6	3	3	0	13	8	0	5	0	0	78
Fort Worth	10	------	1	0	3	7	0	1	0	1	44
Galveston	1	------	0	0	1	3	0	1	0	0	19
Houston	10	------	0	1	11	5	0	6	1	0	87
San Antonio	9	------	6	0	12	6	0	11	0	0	86

City reports for week ended Jan 6, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Montana											
Billings	0	------	0	0	0	0	0	0	0	0	8
Great Falls	0	------	0	0	1	1	0	0	1	0	3
Helena	0	------	0	0	0	0	0	0	0	0	3
Missoula	0	------	0	0	1	0	0	0	3	0	6
Idaho											
Boise	0	------	0	0	3	0	1	0	0	4	5
Colorado											
Denver	3	29	0	1	4	14	0	3	0	47	88
Pueblo	0	------	0	0	0	1	0	2	0	2	11
New Mexico											
Albuquerque	0	------	0	0	2	4	0	2	0	9	15
Utah											
Salt Lake City	0	------	2	553	2	7	0	2	0	20	30
Nevada											
Reno	0	------	0	0	1	0	0	0	0	0	3
Washington											
Seattle	------	------	------	------	------	------	------	------	------	------	------
Spokane	0	1	1	297	1	0	0	------	0	7	29
Tacoma	1	------	0	0	1	1	0	0	0	10	29
Oregon											
Portland	1	------	0	0	6	9	0	0	1	5	67
Salem	0	3	0	0	0	0	0	0	0	4	------
California											
Los Angeles	13	15	0	3	18	48	0	16	1	38	329
Sacramento	0	2	1	4	10	3	0	4	0	0	41
San Francisco	0	3	3	6	15	9	0	15	0	10	186

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts				Illinois:			
Boston	1	1	0	Chicago	5	1	0
New York				Missouri			
New York	2	1	0	Kansas City	1	0	0
New Jersey				North Carolina			
Newark	1	0	0	Winston-Salem	1	0	0
Pennsylvania				Arkansas			
Philadelphia	1	1	0	Little Rock	[1] 1	0	0
Indiana				Utah			
Indianapolis	0	1	0	Salt Lake City	1	0	0

[1] Nonresident.

Typhus fever.—Cases: Pawtucket, R I, 1, Wilmington, N C, 1, Atlanta, 1, Savannah, 2, Miami, 1, Mobile, 1 Deaths Baltimore, 1

Lethargic encephalitis.—Cases Detroit, 1, St Louis, 3, Washington, 1, Atlanta, 1.

Pellagra.—Cases Winston-Salem, 1, Memphis, 1, Los Angeles, 1

Rabies in man.—Memphis, 1 death

FOREIGN AND INSULAR

BELGIUM

Vital statistics—1930, 1931, and 1932.—The following statistics have been published by the Central Office of Statistics, for Belgium:

	1930	1931	1932
Number of births per 1,000 inhabitants	18 65	18 15	17 57
Number of deaths per 1,000 inhabitants	12 83	12 77	12 73
Number of marriages per 1,000 inhabitants	8 89	8 14	7 60

NOTE —The population of Belgium was estimated as 8,092,004 in 1930, 8,159,185 in 1931, and 8,213,449 in 1932

CUBA

Provinces—Communicable diseases—4 weeks ended September 30, 1933.—During the 4 weeks ended September 30, 1933, cases of certain communicable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Diphtheria	1	2			7		10
Malaria	14	2	42	247	4	25	334
Measles	1			2			3
Tuberculosis	9	90	28	70	32	21	250
Typhoid fever	1	6	7	52	9	15	90

IRISH FREE STATE

Vital statistics—Third quarter 1933.—The following statistics for the Irish Free State for the third quarter ended September 30, 1933, are taken from the quarterly return of marriages, births, and deaths, issued by the registrar general:

	Number	Rates per 1,000 population
Population	2, 992, 000	
Marriages	3, 553	4 80
Births	14, 923	20 00
Total deaths	8, 267	11 10
Deaths under 1 year	826	[1]
Deaths from.		
Cancer	774	1. 03
Diarrhea and enteritis (under 2 years)	210	
Diphtheria	91	
Influenza	92	. 12
Measles	4	
Puerperal sepsis	18	[2] 1 21
Scarlet fever	13	
Tuberculosis (all forms)	783	1 05
Typhoid fever	21	
Typhus fever	1	
Whooping cough	67	

[1] Deaths under 1 year per 1,000 births, 55

[2] Per 1,000 births.

JAMAICA

Communicable diseases—4 weeks ended December 30, 1933.—During the 4 weeks ended December 30, 1933, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	2	28	Poliomyelitis	1	1
Diphtheria		4	Puerperal fever		6
Dysentery	9	9	Scarlet fever	1	
Erysipelas		1	Tuberculosis	21	45
Leprosy		2	Typhoid fever	23	65

PUERTO RICO

Notifiable disease—4 weeks ended December 30, 1933.—During the 4 weeks ended December 30, 1933, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico, as follows

Disease	Cases	Disease	Cases
Chicken pox	25	Pellagra	1
Diphtheria	47	Puerperal fever	2
Dysentery	136	Ringworm	4
Filariasis	5	Syphilis	16
Framboesia	1	Tetanus	4
Influenza	220	Trachoma	23
Malaria	[1] 28,536	Tuberculosis	469
Measles	173	Typhoid fever	30
Mumps	38	Whooping cough	339
Ophthalmia neonatorum	3		

[1] Includes results from a special survey

26366°—34——2

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given

CHOLERA

[C indicates cases, D, deaths, P, present]

Place		May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Week ended— October 1933: 7	14	21	28	November 1933: 4	11	18	25	December 1933: 2	9	16	23	30	Jan 6, 1934
China																			
Canton	C		1																
Hankow	C	1	2	1	1														
	D		1																
Tientsin	C		4																
India	C	3,517	6,881	7,695	14,422	2,211	2,091	2,896	2,741	2,306	1,934	1,624							
	D	1,555	3,047	3,237	6,654	1,097	943	1,523	1,283	1,155	1,038	890							
Bombay Presidency	C		3,869	3,604	3,111	407		421	548	352	234	239	275	383					
	D		1,609	1,436	1,412	199		169	266	175	147	129	143	188					
Bombay	C	1	6	1	5	1			3	1				4					1
Calcutta	C	196	77	59	93	26	15	11	16	13	11	13	18	10	13	12	6		
Chittagong	C	7		1			1							1		1			
Madras Presidency	C		276	923	1,058	142	90	155	340	347	263	190							
	D		74	338	444	46	51	68	127	138	111	97							
Madras	C								4	1		2	3	61	25	6	20		
	D								1	2			2	26	11	4	9		
Moulmein	C	3																	
Rangoon	C	1	2																
Vizagapatam	C		4					1											
India (French)																			
Chandernagor	D				2														
Karikal	C				1														
	D				1														
Pondichery	C				2														
	D				2														
Indo-China (see also table below)																			
Pnom-Penh	C	1																	
Saigon and Cholon	C		8	2															

Philippine Islands:[1]																			
Antique Province	C							9	8	2			6	8					
	D							6	10	1			5	6					
Bohol Province	C	80		1	6	1	28	6	52	35	31	39	68	51	23	22	11	33	78
	D	38			3	1	12	3	31	21	14	25	41	25	16	16	10	27	59
Cebu Province	C	2	90	26	39	22	16	15	10	23	18	7	23	15	10	1	6	43	12
	D	2	39	20	28	14	9	9	4	16	12	4	13	10	9	1	3	31	8
Cebu	C	1		1	9	6	6	3	6	1	11	4	1						
	D	1		1	7	2	3	1	2	1	6	1	1						
Naga	C									9	1	1	7	4					
	D									6	1	1	1	3					
Iloilo Province	C		1						12	1			1						
	D		1						11	2			1						
Iloilo	C		1							1			1						
	D		1							2			1						
Leyte Province	C	2		2	1														
	D	2		2	1														
Occidental Negros Province	C	19	6	1										2	2			5	8
	D	9	7	1										1	2			3	5
Oriental Negros Province	C														1	4	1		23
	D														1	4	1		14
Samar Province	C	7		31	[2] 32	11													
	D	5		20	[2] 20	8													
Siam:																			
Bangkok	C	1																	
Provinces	C	28	1																
	D	14	1																

Place		May 1933			June 1933			July 1933			August 1933			September 1933			October 1933	
		1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20	21–31	1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20
Indo-China (French) (see also table above):																		
Cambodia [3]	C	11	14	17	23	31	14	3	1			1						
	D	8	10	9	12	17	6	3	1			1						
Cochin-China [3]	C	5	9	6	4	8	5	6	2	12	3	2	1	1	2	2	5	5
	D	4	8	6	4	8	4	5	2	3	3	2	1	1	2	2	5	3

[1] During the week ended Jan 13, 1934, cholera was reported in the Philippine Islands as follows Bohol Province—Antequera, 3 cases, 2 deaths, Calape, 11 cases, 9 deaths, Clarin, 1 case, 1 death, Cortes, 11 cases, 5 deaths, Loon, 23 cases, 8 deaths, Maribojoc, 3 cases, 1 death, Tubigon, 11 cases, 11 deaths Cebu Province—Argao, 5 cases, 3 deaths, Balamban, 1 case, 1 death; Carcar, 2 cases, 4 deaths, Naga, 2 cases, 1 death, San Fernando, 1 case, 1 death, Sibonga, 1 case, 2 deaths. Iloilo Province—Ajuy, 1 case, 1 death Oriental Negros Province—Bais, 11 cases, 2 deaths, Panaditan, 3 cases, Poblacion, 1 case, Tanjay, 6 cases, 7 deaths.

[2] For 2 weeks.

[3] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE[1]

[C indicates cases, D, deaths; P, present]

Place		May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Week ended— October 1933				November 1933				December 1933				
						7	14	21	28	4	11	18	25	2	9	16	23	30
Argentina (See table below)																		
Azores:																		
Fayal	C				1													
St. Michaels	C				7													
	D				1													
Bolivia (See table below)																		
British East Africa (see also table below)																		
Kenya	C	3	7	13	30	16	2			8	26	3		4				
Tanganyika	D									1								
Uganda	C	53	58	77	113	8	22	15	18	27	18	21	15					
	D	53	58	77	109	7	22	14	18	27	17	21	14					
Ceylon Colombo	C	1	2		1			1						1				
	D	1	2		1			1						1				
Plague-infected rats			4	1											1			
China. Manchuria[2]																		
Dutch East Indies: West Java	C	793	1,434	899	1,465		450	366										
	D	789	1,428	898	1,463		448	366										
Ecuador (See table below)																		
Egypt																		
Alexandria	C		4	1														1
Asyut	C	2																
Faiyum	C	2	4		2	1												
	D		1															
Gharbiya	C				3	1			1									
	D				2	1	1		1									
Girga	C		2															
Minya	C	4	1		1													
Qena	C			1														
	D			1														
Luxor	C			2														
France: Marseille	C			8														
	D			3														
Plague-infected rats				2							1							

Hawaii Territory Hawaii Island—Hamakua—Plague-infected rats					1						2			1		2	1	1
India	C	1,411	3,869	6,209	13,642	3,074	2,941	2,338	3,402	2,316	3,189	2,743						
	D	1,231	2,616	3,560	7,971	1,603	1,546	1,274	2,007	1,216	1,637	1,524						
Bassein	C	1	11	7	3										1			
Plague-infected rats		2	2	1												1	1	
Bombay Presidency	C		2,448	3,971	8,069	2,231		1,382	1,309	1,598	1,565	1,421	1,215	1,342				
	D		1,493	2,313	5,117	1,235		895	798	992	873	947	809	850				
Bombay	C	2	1	1	7	1	1		1		1							
Plague-infected rats		16	5	5	3	1				3	3	1	1			1		
Poona	C					176		150	149	61								
	D					118	199	109	101	53								
Calcutta	C															[3] 1		
	D															[3] 1		
Madras Presidency	C	8	372	867	1,181	231	100	95	95	120	137	122						
	D	6	148	395	547	139	56	46	53	65	55	61						
Rangoon	C	1			2	1							1					
Plague-infected rats			3	1	2							1	1		1	1	1	
Indo-China (see also table below):																		
Pnom-Penh	D	3	2	3	2	2										1		
Saigon and Cholon	C		2	3														
Iraq																		
Baghdad	C	2	7		3		[3] 1			1	1				1			
Basra	C		3															
Libya. Gheran	C				10										3			2
	D				3										1			1
Madagascar (see also table below): Tamatave	C			1														
Morocco	C		8															
Peru (See table below)																		
Senegal (See table below.)																		
Siam	C	2		1														
South-West Africa: [4]																		
Syria: Beirut	C	1	2															
Union of South Africa. Cape Province	C									5	10	3						
United States California:																		
San Benito County—Plague-infected ground squirrels				8														
Santa Clara County—Plague-infected ground squirrels														1				
Whittier	C			1														
	D			1														
On vessel. S.S. Angkor at Beirut from Marseille	C							1										

[1] Including plague in the United States and its possessions.

[2] A report dated Nov 13, 1933, states that plague was reported in Manchuria, China, as follows Fengtien Province, 249 cases, Hsingan Province, 200 cases, Jehol Province, 81 cases; Kirin Province, 479 cases

[3] Imported.

[4] 103 cases of plague with 5 deaths were reported in Ovamboland, South-West Africa from Jan. 1 to Oct. 14, 1933 Antiplague measures have been taken

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases, D, deaths, P, present]

Place		June 1933	July 1933	August 1933	September 1933	October 1933	November 1933
Argentina (see also table above)	C		7			6	4
	D		3			2	1
Bolivia	C		25	1			5
British East Africa (see also table above)							
Kenya	C	6	3	13	26	20	
Uganda	C		47	91	97	71	
Ecuador	C				3		
Indo-China (see also table above):							
Cambodia	D	5	3	6	16	8	
Cochin-China	C		2	5	1		

Place		June 1933	July 1933	August 1933	September 1933	October 1933	November 1933
Madagascar	C		133	100			
	D		132	92			
Peru	C	5	6	7	8	18	19
Callao	C				1	7	
Senegal							
Dakar [5]	C		57		5	4	15
	D		39		3	9	10
Medina [5]	C		31			1	1
	D		23			1	1
Tivaouane [5]	C	1		5	2		

[5] Incomplete reports

SMALLPOX

[C indicates cases, D, deaths, P, present]

Place		May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Week ended— October 1933: 7	Oct. 14	Oct. 21	Oct. 28	November 1933: 4	Nov. 11	Nov. 18	Nov. 25	December 1933: 2	Dec. 9	Dec. 16	Dec. 23	Dec. 30	Jan 6, 1934
Algeria:																			
Algiers Department	C		2								1								
Constantine Department	C		1																
Arabia: Muscat—Oman Sultanate	C	73																	
	D	20																	
Belgian Congo	C		5		4														
	D		1																
Bolivia (See table below.)																			
Brazil: Porto Alegre (alastrim)	C	6	1	1	12			1	4	1									
British East Africa: Tanganyika	C	10	6	21	30	12	12	24	4	26	33	132							

British South Africa.																			
Northern Rhodesia	C		1	1															
Southern Rhodesia	C		1		2														
Canada																			
British Columbia	C	[1]1																	
Manitoba	C			1															
Ontario	C	[1]1																	
Saskatchewan	C	7			1														
Ceylon																			
Colombo	C	9	6	9							1								
Galle	C		1																
China:																			
Amoy	C	2																	
Canton	C									1		1		1	1	1	2		
Dairen	C	2	3		1		1	1	1	2	3	7	5	35					
Foochow	C	P	P																
Hangchow	C		3	1									1						
	D		2	1															
Hankow	C				3									1	1				
	D				1														
Hong Kong	C	8	3	1									1			1	1		
Nanking	C	2	2											1					
Shanghai	C	27	22	10	5	2			1	4	1	6	6	3	6	10			
Swatow	C	4					1	1		1									
Tientsin	C	16	2																
Chosen. (See table below.)																			
Colombia Buenaventura	D		1																
Costa Rica (See table below.)																			
Dahomey. (See table below.)																			
Ecuador. (See table below.)																			
Egypt.																			
Alexandria	C									1	2								1
Asyut	C		112	109	43	6	8	21	5		1		6	11					
	D		23	11	6	1	1	1	1					5					
Beheira	C	6																	
Beni-Suef	C				31	10	2	1											
	D				7	1	1												
Cairo	C	4	1		1												1		
Dakahliya	C		4	1															
Faiyum	C		44	18	3	1							13						
Gharbiya	C	142	83	39	5		1		1		4	3		3					
Girga	C		2	2			1	5	3					16					
Minufiya	C	26																	
Qena	C		9	25	4			13	12		6	2	20	7					
Provinces	C	287	499	297	150	18	12	40	25	25		38	105	65					
Great Britain:																			
England and Wales	C	71	55	32	20	3	3		4	1	1	1	6	3	9	4	9		
London	C	51	40	28	14	3	3		4	1	1	1	6	3	9	4	9		
London and Great Towns	C	56	49	31	15	3	3		4	1	1	1	6	3	9	4	9		
Greece (see also table below): Salonika	C		8		9														
Honduras: Tegucigalpa	C	3																	

[1] For 2 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths, P, present]

Place		May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Week ended— October 1933 7	14	21	28	November 1933 4	11	18	25	December 1933 2	9	16	23	30	Jan 6, 1934
India	C	23,631	14,599	7,069	7,052	1,136	1,107	1,195	1,261	1,218	1,254	1,317							
	D	7,008	4,256	1,768	1,625	310	215	283	271	281	269	299							
Bassein	C	16	9	10	19	3	3	2	4	5	3	2	2	4	1	10	1		
	D	11	8	6	6	3		2	2	1	1	3	1	3		3	2		
Bombay Presidency	C		1,942	1,029	873	130	191	127	151	121	161	117	274	232					
	D		376	186	160	23	14	29	25	22	43	15	35	40					
Bombay	C	88	34	14	1	2		1	1		2		2	3	2	2	5		
	D	58	25	8	1	2		1	1		2		1	3	2	1	2		
Calcutta	C	134	59	18	10	1	3		4	1	8		4	9	8	9	6		
	D	107	49	8	3	1	1		1	1	1		3	1	5	6	4		
Cochin	C	2	4		2				1										
Karachi	C	19	16	5				2				1			2		1		
Madras Presidency	C		3,571	2,851	2,944	602	540	646	644	697	545	533							
	D		726	587	513	132	106	142	127	121	99	111							
Madras	C	144	234	223	209	30	22	13	16	13	7	7	14	14	17	13	11		
Moulmein	C	12																	
Negapatam	C	3	12	21	8		1	4	4	7		3	7	8	5	3	3		
Rangoon	C	6	4	1	4	1					1		1	2	1	2	3		
Tuticorin	C			2					1	5			1						
Vizagapatam	C	5	14	11	2		1			1			1		1	1	1		
India (French):																			
Chandernagor	D		1																
Karikal	C	5			1	1						1	2						
	D	5			1	1						1	2						
Pondichery	C	129	139	181	210	59	25		17	15	22	19	15						
	D	82	73	70	104	32	19		12	7	10	9	6						
Indo-China (see also table below). Saigon and Cholon	C		1		1											1			
Iraq	C		17	22	8	27	8	1		10	2	10	113						
Baghdad	C					1		1				1	2	1	1	1			1
Basra	C	2			4					3						1			
Japan																			
Kobe	C		1																
Tokyo	C	2	45																

Place																			
Mexico (see also table below)																			
Coahuila	C	2																	
Juarez [2]																			
Mexico, D F	C	5	1	12															
Monterrey	D			1						1							1		
Saltillo	D	3															1	1	
San Luis Potosi	D	1	9	8															
Torreon	D				1		1	1											
Vera Cruz	C								1		1								
	D								1		1								
Morocco. (See table below)																			
Nigeria	C		675	361	113		74		92	268	103								
Nyasaland (See table below)																			
Palestine	C		13																
Paraguay Asuncion	D		3																
Persia	C	31	26	20	10		8	12	25			6	6						
	D	62	9	7	11		2	1	2	2		2	1						
Teheran	C		21	17	3	3	2		6		2	3	3		1				
	D		8	5	1	1		1	2	2					1				
Peru. (See table below)																			
Poland	C	1	1						1		1								
Portugal (see also table below).																			
Lisbon	C	3	5	3	3								1						
Oporto	C		3	1				2		1	1								
Siam	D		5	1															
Sierra Leone	C	6	45	6	250		[1] 421		[1] 113		[1] 530		[1] 48						
Spain	C		59	29	16	4	7			27	13								
Sudan (Anglo-Egyptian)	C	1	5		1							14	1		15	5	1	40	17
Syria:																			
Beirut	C	6	14	21													12	8	12
Provinces	C	4	9	11	7	16			18	2	19	14		6	18		19	1	
Turkey (See table below)																			
Union of South Africa Orange Free State	C	P																	
On vessels.																			
S S Fernmoor at Vancouver	C	4																	
S S Arracan at Newport	C			1															
S.S. Clan Macquarrie at Suez	C				1														
S.S Sikh at Madras	C			1															
S.S Lichtenfels at Suez from Calcutta	C				1														
S S. Shahjehan at Madras	C				1														
S S Rohna at Penang from Madras	C									1									

Place		June 1933	July 1933			August 1933			September 1933			October 1933			November 1933	
			1–10	11–20	21–31	1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20	21–31	1–10	11–20
Dahomey	C	2	2	1		6	1	1	20	6	1	2	8	15	9	9
	D	1	1				1	1	5	1			6		6	6
Indo-China (see also table above)	C	197	74		31	20	38	21		44	37	39	20	78	24	22
	D	76	31		6	5	15	3		19	13	15	5	18	10	8

[1] For 2 weeks.

[2] Dec. 18, 1933 90 cases of smallpox were reported in Juarez, Mexico, with 18 deaths occurring from Dec 1 to 16, 1933

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths; P, present]

Place		June 1933	July 1933	August 1933	September 1933	October 1933	November 1933
Bolivia	C	12	10	12	15	34	39
Chosen	C		3				
Costa Rica	C			2			
Ecuador	C	23	12	2			
Greece	C			1		1	
Mexico (see also table above)	C		9	31	18		
Morocco	C	10	8	1	2	3	16
Nyasaland	C	248	336	347	318		
Peru	C		84	56	90	23	
Portugal (see also table above)	C			59	105		
	D			16	27		
Turkey	C	13		8	56		

TYPHUS FEVER

[C indicates cases, D, deaths, P, present]

Place		May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug 26, 1933	Week ended—September 1933: 2	9	16	23	30	October 1933: 7	14	21	28	November 1933: 4	11	18	25	December 1933: 2	9	16
Algeria:																				
Algiers Department	C	11	7	2							1							9		
Constantine Department	C	157	66	21	2	4	5	1	4	1		4				1	7	1	2	3
Bone	C		1	1										1						
Oran Department	C	1	2			2							1					1		
Basutoland (See table below.)																				
Bolivia (See table below)																				
British East Africa: Uganda	C	7	4	4	3	1	5	2			1	1		1	1					
Bulgaria	C	4	2	3				1				3		1		1	1			
Chile	C			1,028	408				[1] 2,180				[1] 2,620							
Antofagasta	C	1																		
San Pedro [2]																				
Santiago	C	290	1,112	392	124	282	233	218	214	224	292	343	300	244	335	335	297	262	286	
Valparaiso	C	1	7	13	5	8	11		10	4	8	22	9	5	12	24	13	11	8	17
China:																				
Hangchow	C			5																
Hankow	C								1								1	1		
Harbin	C			11																
Nanking	C		1	1						1										
Shanghai	C		1	1				1					1	1				2		
Tientsin	C		1																	

Chosen (See table below)																				
Czechoslovakia (See table below)																				
Egypt.																				
Alexandria	C	17	18	1		1														
Asyut	C			2													1			
Beheira	C	569	257	61	7	3	2	4	2	8	5	2	9	9		10	24	1	25	
Cairo	C	28	9	4				1												
Dakahliya	C	140	82	42	7	2	1	1	3						2	2	3	5		
Damietta	C	3	3	1	1															
Gharbiya	C	591	310	79	11	10	8	9	3	1	1	8			3	5	12	14	6	
Minufiya	C		52	36	1	1	2		2	3	5	2	2	2	3				5	
Qena	C				1			4	4			3			3	2	1	2		
Provinces	C	1, 591	785	226	29	22	17	25	14	13	12	15	12	14	29	20	45	27	38	
Greece (See table below)																				
Guatemala (See table below)																				
Hungary	C	11										5		10						
Iraq																				
Amara	C								1			4								
Baghdad	C	2	2	1																
Irish Free State:																				
Kerry County—Dingle	C										4			4						
Waterford County—Lismore	C			1																
Japan																				
Kobe	C												1							
Osaka	C															1				
Latvia (See table below)																				
Lithuania	C	15	1	11														12	3	
Mexico (see also table below).																				
Mexico, D F	C	9	6	1	2	2	2		10	5	3	6		14	15	10	7	6		
San Luis Potosi	D								1	1										
Torreon	C			1		1	1								1		2			
Morocco	C	63	14	12	1	1				1	1								2	
Palestine	C	1	20	3	1	1			1				4	4						
Persia	C	25	21	15	4	1	3	6	10	8	5	6	1	5	5	1				
Peru. (See table below)																				
Poland	C	322	196	66	6	8	12	8	17	17	8	23	18	34	41	21	24	51	47	
	D	13	11	6				1		2	1		2	3		2	5	4	4	
Rumania (See table below)																				
Spain, Madrid	C					1		1		1										
	D						1													
Syria	C	21	1	2																15
Trans-Jordan	C	4	2																	
Tunisia:																				
Tunis	C						1				2									
Provinces	C	65	36																	
Turkey. (See table below)																				
Union of South Africa (See table below)																				
Yugoslavia (See table below)																				
On vessel S S Chiloe at Antofagasta	C	1																		

[1]For 4 weeks.

[2] Incomplete reports from San Pedro, Chile, for the month of November 1933 show 113 cases of typhus fever

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths, P, present]

Place		June 1933	July 1933	August 1933	September 1933	October 1933	November 1933
Basutoland	C		208	279	259		
Bolivia	C	71	36	34	99	129	39
Chosen	C		59		3		
Czechoslovakia	C	9	6	1		1	
Greece	C	6	5	4	4	3	5
Guatamala	C	3	1	4	5		6
Latvia	C			1			
Mexico (see also table above)	C		12	19	42		
Peru	C	23	20	60	84	55	

Place		June 1933	July 1933	August 1933	September 1933	October 1933	November 1933
Rumania	C		57	22	13	28	26
Turkey	C	13	5	7	9	20	6
Union of South Africa							
Cape Province	C	124	195	135	141		
Natal	C	122	23	18	43		
Orange Free State	C	34	61	140	180		
Transvaal	C	7	5	3	103		
Yugoslavia	C	136	89	33	5	38	13

YELLOW FEVER

[C indicates cases, D, deaths, P, present]

Place		May 28–June 24, 1933	June 25–July 29, 1933	July 30–Aug 26, 1933	Week ended— September 1933: 2	Sept. 9	Sept. 16	Sept. 23	Sept. 30	October 1933: 7	Oct. 14	Oct. 21	Oct. 28	November 1933: 4	Nov. 11	Nov. 18	Nov. 25	December 1933: 2	Dec. 9
Brazil																			
Ceara State																			
Lavras	C	1																	
	D	1																	
St Mathew	C	1		1															
	D	1		1															
Pernambuco State																			
Granito	C		2																
	D		2																
Novo Exu [1]	C		1																
	D		1																

French West Africa																			
Guinea	C						[2] 1												
Niger Territory	C			2	1				2	1			1						
	D			2					2	[3] 2			1						
Gold Coast [4]	C	1				[2] 1					[3] 1				1			1	
	D					[2] 1									1				
Ivory Coast																			
Bouafle	C	1																	
Gagnoa	C	[2] 1																	
	D	1																	
Nigeria Kano	C													1					
	D													1					
Senegal																			
Bakel	C							2			1								
	D										1								
Birkelane	C																	2	
	D																	1	
Dakar	C															1			
	D															1			
Kaffrine [5]	C										1								
	D										1								
Kaolak	C																	1	
	D																	1	
St Louis	D		[6] 1																
Sebikotane	C															1			1
	D															1			1

[1] 2 cases of yellow fever with 2 deaths were reported in Novo Exu, Pernambuco State, Brazil, during the month of June 1933

[2] Suspected

[3] Includes 1 suspected death

[4] On Jan 5, 1934, 1 case of yellow fever was reported in Keta, and on Jan 10, 1934, 1 case was reported in Dunkwa, both in Gold Coast

[5] On Jan 9, 1934, 1 case of yellow fever was reported in Kaffrine, Senegal

[6] Imported

X

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 5

FEBRUARY 2 - - 1934

IN THIS ISSUE

Some of the Problems Presented by Amoebic Dysentery
Gas Hazards in Sewers and Sewage-Treatment Plants
Directory of City Health Officers in Large Cities
Deaths in Large Cities During Week Ended January 13
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D C. - - - - - - Price, 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

	Page
Amoebic dysentery—Problems presented by the outbreak in 1933	141
Gas hazards in sewers and sewage-treatment plants	145
City health officers, 1933—Directory of those in cities of 10,000 or more population	155
Court decision relating to public health	171
Deaths during week ended January 13, 1934	
Deaths and death rates for a group of large cities in the United States	172
Death claims reported by insurance companies	172

PREVALENCE OF DISEASE

United States.	
Current weekly State reports	
Reports for weeks ended January 20, 1934, and January 21, 1933	173
Summary of monthly reports from States	175
Weekly reports from cities	
City reports for week ended January 13, 1934	176
Foreign and insular·	
Canada·	
Ontario Province—Communicable diseases—5 weeks ended December 30, 1933	180
Quebec Province—Communicable diseases—2 weeks ended January 13, 1934	180
Mexico—Matamoros—Malaria	180
Cholera, plague, smallpox, typhus fever, and yellow fever:	
Cholera	181
Plague	181

PUBLIC HEALTH REPORTS

VOL. 49 FEBRUARY 2, 1934 NO. 5

AMOEBIC DYSENTERY

PROBLEMS PRESENTED BY THE OUTBREAK IN 1933 *

By G W McCoy, *Medical Director, United States Public Health Service*

The recent (1933) outbreak of amoebic dysentery, with a total of several hundred cases, which had its origin in Chicago has led to widespread interest in this disease on the part of public health authorities, clinicians, and research workers The public health officer interests himself in the mode of propagation of the infection and the means of prevention of spread; the clinician is concerned with the diagnosis and treatment of the clinical condition (indeed, early recognition and intelligent treatment yield most gratifying results); and the research worker is concerned with such problems as epidemiology, mechanism of transmission, and the life history of the parasite, *Endamoeba histolytica*, outside the human body. Although various clinicians and special students of the problem have reported in years gone by rather extensive series of cases in different parts of the country, and research workers have shown the widespread prevalence of human carriers of cysts of the parasite, amoebic dysentery generally has not figured largely in medical literature of the United States or as a cause of morbidity or mortality.

The disease has been regarded generally as endemic in certain areas, but as not likely to occur in epidemics. So far as the information at hand goes, the outbreak originating in Chicago in 1933 constitutes the first prevalence that can be regarded as epidemic in a civil community. A reservation must be made with respect to this, however, by pointing out that extensive outbreaks may have occurred in the past without having been attributed to a common source; in other words, there may have been occurrences similar to that which developed in Chicago which did not come to the attention of sanitary authorities because cases of the disorder in various communities were not traced to a definite focus. Dysentery has been known to prevail very extensively in armies in campaigns, but there is not much evidence to show the exact type of this disease that has occurred under these conditions. In the World War, bacillary and amoebic infections occurred side by side in some military units, and occasionally in the same person.

* Received for publication Jan 18, 1934.

One of the first questions that arises in the mind of anyone approaching the problem presented by the outbreak which originated in Chicago is whether the disease really is amoebic dysentery. This inquiry is prompted largely by the peculiar epidemiological features presented by the outbreak, which, as already indicated, are unique. Careful consideration of clinical and pathological (gross and microscopic) data leaves one in no doubt that the condition is amoebic dysentery and that all of the manifestations that have been noted in the outbreak fall within the previously recognized variations of the disease. It has been suggested that in this outbreak there is a factor, perhaps a virus or a bacterium, in addition to the admitted role of the *Amoebas*. All that is to be said in this connection at the present time is that the burden of proof rests on those who advance this hypothesis. If later work should develop the fact that some factor in addition to *E. histolytica* is operative, still it would be incumbent to show that such additional factor has not always operated in amoebic dysentery. It long has been recognized that occasionally the *E. histolytica* has been associated with bacteria of the dysentery group, or vice versa, and that it may be difficult, or impossible, to say which manifestations are due to either organism.

We never have had very satisfactory information as to the origin of infection in amoebic dysentery, though certain of the advocates of each of the various possible sources to be mentioned have regarded the matter as settled. The possible sources of infection may be considered to be as follows:

(1) Infection directly from "carrier" to victim, usually in the preparation or handling of food;
(2) Contamination of water supplies, local or general;
(3) Eating of uncooked vegetables from soil that has been fertilized with human excreta.
(4) Flies.

At present it is best to maintain an open mind on this question and to realize that the source of infection is not necessarily the same in epidemic as in endemic prevalence of the disease. Obviously, fully efficient means of control must await definite information as to the method of spread. If vegetables or water supplies should be found to play the dominant role in the transmission of this disease, prevention is relatively easy.[1] If carriers are the chief source of infection, the problem is not so simple. Surveys in several parts of the world have shown a very high incidence of *Amoeba* infection among food handlers—possibly a significant finding. The inadequacy of methods of detecting *Amoeba* carriers deserves to be mentioned. Several examinations are necessary to be reasonably sure that any given individual is not an *Amoeba* carrier, and no practicable

[1] The prevention of possible transmission by flies may be simple or not, depending on circumstances.

number of examinations will settle this question conclusively The intermittence of the carrier condition is another factor of uncertainty. The time and effort required for successfully conducting carrier examinations is much greater than is the case in most laboratory procedures, and the expense is correspondingly large. Another difficulty lies in the control of the carriers when they are detected

There are certain questions that require consideration from the point of view of examinations intended to detect carriers First of these is whether all carriers are of potential danger to those whose food they might contaminate or to whom the carrier might spread the infection in other ways. One school of protozoologists maintains firmly that all carriers are a menace, while another school holds that pathogenic *Amoebae* may be distinguished from those not pathogenic by readily applied laboratory tests The second question (and it is one on which there is much difference of opinion) is whether every cyst carrier exhibits clinical or pathological manifestations due to *E histolytica*.

A feature of the amoebic dysentery problem chiefly of interest to the clinician is the readiness with which the symptoms are mistaken for those of other conditions. This has become very apparent only since the widespread outbreak originating in Chicago first brought cases to the attention of physicians who had not become familiar with the condition through previous experience. Errors in diagnosis spring chiefly from two causes: (*a*) It does not occur to the practitioner that the condition with which he is dealing may be dysentery, and (*b*) he may accept too readily as conclusive the negative results of laboratory examinations.

From a study of published and unpublished data, the diagnoses most likely to be made erroneously are appendicitis, colitis, ulcerative colitis, cholecistitis, hepatitis (in cases of amoebic involvement of the liver), malignancy of the intestines, duodenal disease, tuberculosis of the intestine, pleural effusion (in cases of liver abscess), typhoid fever, ulcer of the stomach. That there are very real difficulties in distinguishing some of these conditions is shown by the fact that errors have been made even under conditions most favorable for arriving at a correct diagnosis. A few cases have been submitted to surgical interference. The most frequent situation under which this has occurred has been the erroneous diagnosis of appendicitis. Microscopic or cultural examinations of stool specimens, in connection with efforts to arrive at a diagnosis of amoebic dysentery, need to be interpreted in the light of clinical manifestations, as either a negative or a positive result of the laboratory examinations may be misleading. Stools may be persistently negative in a series of examinations only to have the characteristic organism appear at a later examination, the physician being misled, however, by the results of the earlier

tests. On the other hand, a positive report may be misleading, since an amoebic cyst carrier may be suffering from a condition not related to the presence of the protozoa in his stool. In the light of recent experience it seems fair to say that the practitioner should exercise care in the interpretation of results of laboratory tests He will be likely to avoid error by relying on his judgment of clinical manifestations rather than by depending too implicitly on reports of laboratory tests

These considerations of this phase of the subject are entirely apart from the matter of the reliability of laboratory reports. Laboratory workers of even modest experience in the recognition of intestinal protozoa should have no difficulty in detecting the vegetative forms of *E histolytica*, the forms most important in dealing with amoebic dysentery, since the presence of red blood cells within the parasite and the rather characteristic motility readily permit a diagnosis. The cysts are not so readily differentiated and even the experienced worker may be in doubt as to a given specimen

The problem of the prevention of amoebic dysentery, as it presents itself to the administrative health officer, is not susceptible of ready solution. More information is needed before wholly satisfactory measures can be inaugurated. Perhaps the first suggestion will be the detection, by stool examinations, of *Amoeba* carriers among food handlers in general and the elimination of the carriers from the food-handling groups. The difficulties encountered here have already been mentioned While this procedure may be inapplicable to all food handlers, it doubtless will serve a useful purpose in special circumstances, such as in instances where suspicion points to a particular group as a probable source of infection.

It has been suggested that the education of food handlers in personal hygiene would constitute a valuable means of prevention of spread of the infection. The measure suggested is careful cleansing of the hands, or even disinfection by chemicals, on coming on duty and after each visit to the toilet. It remains to be seen whether any considerable number of individuals can be made sufficiently conscious of the possible menace to others to render this measure effective.

On account of the high incidence of *Amoeba* carriers among food handlers, treatment with amoebicides of all members of food-handler groups has been suggested; but this does not seem advisable in the present stage of our knowledge. The necessity for medical treatment of recognizable clinical cases, even though mild, among food handlers or others, is obvious.

GAS HAZARDS IN SEWERS AND SEWAGE-TREATMENT PLANTS [1]

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Gas hazards in sewers and sewage-treatment plants are those due to inflammable and poisonous gases and to oxygen deficiency. Inflammable and poisonous gases may be derived from three general sources Low volatile liquids which enter as part of the sewage, leakage from gas mains into the sewers, or the products of fermentation or digestion of sewage

The inflammable or poisonous gases usually found in treatment plants are methane, hydrogen, carbon dioxide, and possibly carbon monoxide and hydrogen sulphide Mr G. W Jones, chemist, Pittsburgh Experiment Station, United States Bureau of Mines, has summarized the composition and inflammable limits of gases from sewage sludge digestion tanks,[2] and his summary is presented in the accompanying table.

TABLE 1 —*Composition and inflammable limits (in percent) of gases from sewage sludge digestion tanks*

Source	Imhoff tank		Septic tank		Imhoff tanks				Imhoff tank				Range
					Foaming		Non-foaming		Lower compartment		Upper compartment		
Sample number	*a*	*b*	*c*		*d*	*e*	*f*	*g*	*h*	*i*	*j*	*k*	
Reference	(1)	(1)	(2)	(2)	(2)	(2)	(2)	(2)	(3)	(3)	(3)	(3)	
Carbon dioxide	4.4	5 2	13 6	17 0	19 8	29 4	3 3	28 5	11 8	9 6	20 0	23 4	3.3 –29 4
Oxygen	0 6	0 5	0 0	0 0	0 3	0 0	0 0	0 0	1 2	1 0	-----	-----	0 0 – 1 2
Hydrogen sulphide	0 0	0 0	0 0	0 0	0 0	0 1	0 0	0 0	0 0	0 0	-----	-----	0 0 – 0 1
Hydrogen	7 9	8 2	3 5	0 0	0 0	0 0	0 0	0 0	4 6	0 0	1 8	1 7	0 0 – 8 2
Methane	84 2	82 8	72 5	78 0	68 7	66.6	78 2	63 0	70 2	66 1	70 0	67 5	63 0 –84 2
Nitrogen	2 9	3.3	10 4	5 0	11 2	3 9	18 5	8 5	12 2	23 3	8 2	7.4	2 9 –23 3
Inflammable limit													
Lower	5 30	5 30	6 55	6 70	7 40	7 80	6 40	8 30	6 55	7 80	7 55	7 80	5 30– 8 30
Upper	16 00	16 10	17 90	16 65	18 25	18 35	16 85	19 15	18 45	19 25	18 45	18 50	16 00–19 25

References (1) Gas from Imhoff Tank By C C Mommon Eng News, 71, 1914, p 760 (2) Some Observations on Sewage Tank Gases By A M Buswell and S I Strickhouser Ind Eng Chem, 18, 1926, p 407 (3) Results of Sewage Treatment By H E Babbitt and H E Schlenz Univ Illinois Bull. no. 198, 1929, pp 88 and 92.

The tabulation gives the analyses of typical sewage gases. It will be noted from a study of this table that the oxygen varies from 0 to 1.2 percent, carbon dioxide from 3 to 30 percent, hydrogen sulphide from 0 to 0.1 percent, hydrogen from 0 to 8.2 percent, methane from 63 to 84.2 percent. Jones calls attention especially to the explosion hazards and gives four factors as essential.

[1] Presented before the Illinois Society of Engineers, at Chicago, Jan. 23, 1933

Jones, G. W.: Explosion and Health Hazards in Sewage Works Operation 1933

Katz, in his paper on Gas Hazards in Street Manholes,[3] states that the following are the principal gases found

Poisonous and explosive gases found in manholes

Gas	*Source*
Ammonia, explosive	Refrigerating plants
Benzol, explosive	Motor vehicles, storage tanks
Carbon dioxide, nonexplosive	Products of combustion, sewer gas
Carbon monoxide, explosive	Manufactured fuel gas, flue gas, products of combustion, exhaust gas from motors
Ethane, explosive	Natural gas, manufactured fuel gas
Gasoline, explosive	Motor vehicles, storage tanks
Hydrogen, explosive	Artificial fuel gases, electrolysis of water
Hydrogen sulphide, explosive	Sewer gas, coal gas
Methane, explosive	Natural gas, manufactured gas, sewer gas
Sulphur dioxide, nonexplosive	Burning insulation
Unsaturated hydrocarbons, explosive	Manufactured fuel gases.

It will be noted that only a few of the gases mentioned by Katz come from sewage itself It will be noted also that a number of those gases are both explosive and toxic. This applies to all but methane, ethane, hydrogen, and carbon dioxide, although carbon dioxide is of low toxicity. Carbon monoxide is the poisonous gas most frequently found in manholes and may occasionally occur in treatment plants. Although reported by Hallé[4] as early as 1785 as having caused deaths due to gases from sewers in Paris, according to Katz hydrogen sulphide has not been found in manholes in dangerous concentrations and it probably does not occur in dangerous concentrations in treatment plants.

PROPERTIES OF GASES FOUND IN SEWERS AND TREATMENT PLANTS[5]

AMMONIA, NH_3

Inflammable limits in percentage by volume Lower, 16; upper, 27.
Boiling point, −35.5° C
Percentage causing dangerous illness in ½ to 1 hour, 0 25 to 0 45
Percentage that can be borne without severe effects for ½ to 1 hour, 0.03.
Maximum safe concentration, 0 01 percent.

Ammonia is a colorless gas of sharply penetrating odor. The symptoms of poisoning are acute inflammation of the respiratory organs, cough, edema of the lungs, chronic bronchial catarrh, redness of the eyes, increased secretion of saliva, and retention of urine.

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[3] Katz, S. H , Meiter, E G , and Bloomfield, J J · Gas Hazards in Street Manholes Report of Investigations, Serial No 2710, U S Bureau of Mines, October 1925. 20 pp.

[4] Hallé, M : Recherches sur une espèce de méphitisme des fosses d'aisance 1785

[5] Unless otherwise indicated, the inflammable limits of the various gases are taken from Bureau of Mines Bulletin No 279, Limits of Inflammability of Gases and Vapors, 1931, and the toxic limits from International Critical Tables, vol. II, 1927, pp. 318-320.

BENZOL, C_6H_6

Inflammable limits in percentage by volume Lower, 1 4; upper, 8
Boiling point, 80 2° C
Percentage that can be borne without severe effects for ½ to 1 hour, 0 31 to 0 47
Maximum safe concentration, 0 15 to 0 31 percent

Benzol is an extremely volatile, colorless fluid As a vapor it enters the body through the respiratory organs and by reabsorption through the skin. Symptoms of poisoning are headache, vertigo, anemia, muscular tremor, scarlet lips, spots of extravasated blood in the skin, irritant cough, and fatty degeneration of the liver, kidneys, and heart.

CARBON DIOXIDE, CO_2

Boiling point, −78 2° C
Percentage fatal in 30 minutes or less, 30
Percentage causing dangerous illness in ½ to 1 hour, 6 to 8
Percentage that can be borne without severe effects for ½ to 1 hour, 4 to 6.
Maximum safe concentration, 2 to 3 percent

Carbon dioxide affects the respiratory rate according to its concentration in the air It has been found that men can breathe air containing many times the amount of carbon dioxide found in our worst ventilated theaters and assembly halls, which, according to Rosenau, do not contain above 0.5 percent carbon dioxide One half of 1 percent of carbon dioxide in normal air causes a slight and unnoticeable increase in the ventilation of the lungs; that is, a man exposed to one half of 1 percent of carbon dioxide will breathe a little deeper and a little faster than when in pure air. With'2 percent of carbon dioxide in the air the lung ventilation will be increased about 50 percent; with 3 percent to about 100 percent; with 5 percent to about 300 percent, and the breathing will be laborious; and 10 percent cannot be endured for more than a very few minutes. According to Sollmann, if oxygen deficiency is excluded by inhaling gas mixtures containing 20 percent of oxygen, no effects occur until the concentration of 3 percent by volume of carbon dioxide is reached With this concentration there is some hyperpnea and discomfort; 8½ percent produces in a few minutes distinct dyspnea, rise of blood pressure, and congestion which become insupportable in 15 or 20 minutes; but these symptoms disappear promptly in fresh air. The symptoms increase with 15 percent, but even 20 percent is not dangerous in an hour to animals and probably not to man. With 25 to 30 percent the stimulant phenomena pass into depression, with diminished respiration, fall of blood pressure, coma (generally without convulsions), loss of reflexes, anesthesia, and gradual death after some hours, the heart outlasting the respiration. With higher concentrations, the stimulation is still briefer. With pure carbon dioxide, death may

occur in a few minutes as a mixed effect of carbon dioxide and anoxemia

The air in manholes and sewage-treatment plants may be deficient in oxygen owing to the oxidation of organic material or to dilution by inert gases from outside sources, such as natural gas (methane) Although oxygen is not usually considered toxic or noxious, a variation in its concentration cannot be neglected, as untoward effects develop if the variation is marked Man is so made that he breathes easily and works best when the air contains about 21 percent of oxygen, the amount usually in air, but he is able to live and work, although not so well when there is less oxygen. When about 17 percent of the air is oxygen, a man at work will breathe a little faster and a little deeper, about the same as when he first goes from sea level to a height of 5,000 feet Men breathing air that has as little as 15 percent of oxygen usually become dizzy, notice a buzzing in the ear, have a rapid heartbeat, and often suffer from headache Very few men are free from these symptoms when the oxygen in the air falls to 10 percent. Haldane, the English physiologist, says that under certain conditions men may be conscious even with as little as 3½ percent of oxygen in the air they are breathing. However, under other conditions men faint or become unconscious when the air contains 9 percent of oxygen or more.

ETHANE, C_2H_6

Boiling point, $-93°$ C.
Inflammable limits in percentage by volume Lower, 3 2; upper, 12 5.

METHANE, CH_4

Boiling point, $-164°$ C.
Inflammable limits in percentage by volume Lower, 5 0, upper, 15.

Ethane and methane, or natural gas, may be present. Their importance is not due to physiological or noxious action, but to the fact that they form explosive mixtures with the oxygen of the air, and this may result in disaster Furthermore, the methane may dilute the oxygen of the air to such an extent as to produce the effects of low oxygen mentioned above.

GASOLINE, C_6H_{14} TO C_7H_{16} [5]

Inflammable limits in percentage by volume: Lower, 1.4; upper, 6.
Boiling point (boiling range), 50° to 140° C.
Percentage causing dangerous illness in ½ to 1 hour, 2 0 to 2 5
Percentage that can be borne without severe effects for ½ to 1 hour, 0 1 to 0.3.
Maximum safe concentration, 0.1 percent.

Gasoline vapors, when inhaled, cause headache, nausea, delirium, vertigo, and unconsciousness. Burning pains in the chest and irrita-

[5] The toxic limits for gasoline are taken from Bureau of Mines Technical Paper 272, Permeation of Oxygen Breathing Apparatus by Gases and Vapors. 1921.

tion which cause coughing are experienced when the concentration is moderately high—0 7 percent In some studies carried out by the Bureau of Mines it was found that exposure of men to 0.1 percent of gasoline vapor caused dullness, unsteadiness, and giddiness in 50 minutes, 0.3 percent caused slight irritation of the eyes and moderate symptoms of dizziness in 30 minutes, and 0 7 percent caused coughing, marked irritation of the eyes and nose, numbness of the legs, and unsteadiness in 10 minutes, 1 percent is about the maximum concentration that a man can stand, owing to the irritating effect on the skin as well as on the mucous membrane The above symptoms were observed in men who had not been exposed to gasoline fumes in such concentrations regularly before the experiments were carried out. Tolerance to gasoline develops to some extent after repeated exposures. In some studies conducted by Mr A C Fieldner, it was found that 2 to 2 5 percent gasoline vapor, when breathed, even though the body was unexposed, rendered a man dizzy and soon became intolerable.

In a study carried out by Dr Howard W. Haggard for the Bureau of Mines, unconsciousness occurred in dogs when exposed to slightly more than 1 5 percent concentration, signs of discomfort appeared at about 0.8 percent, convulsions usually occurred at about 1 percent, complete surgical anesthesia at about 2 3 percent, and death at about 2.4 percent.

Hydrogen Sulphide, H_2S

Inflammable limits in percentage by volume Lower, 4 3, upper, 46
Boiling point, −60 2° C.
Percentage fatal in 30 minutes or less, 0 06 to 0 1.
Percentage causing dangerous illness in ½ to 1 hour, 0 05 to 0.07.
Percentage that can be borne without severe effects for ½ to 1 hour, 0 02 to 0 03
Maximum safe concentration, 0.005 to 0 01 percent

Hydrogen sulphide has a very repulsive odor in low concentrations that may serve as a warning Its presence in sewers and treatment plants has been attributed to the decomposition of sewage. Its toxicity is comparable to that of hydrogen cyanide.

Poisoning by hydrogen sulphide is of two types, namely, acute and subacute, causing asphyxiation and irritation (conjunctivitis, bronchitis, pharyngitis, and depression of the central nervous system), respectively. Death from asphyxia is caused by paralysis of the respiratory center, while death from subacute poisoning is associated with edema of the lungs. The exact low limit of hydrogen sulphide concentration at which it ceases to act as a poison has not as yet been determined, but is evidently below 0.005 percent; 0.06 to 0.1 percent is sufficient to cause serious symptoms within a few minutes.

In low concentrations hydrogen sulphide produces symptoms of headache, sleeplessness, dullness, dizziness, and weariness. Pain in the eyes, followed by conjunctivitis, is fairly constant, while bron-

chitis and pains in the chest are frequent Further poisoning produces depression, stupor, unconsciousness, and death. The heart continues to beat after respiration has ceased.

SULPHUR DIOXIDE, SO_2

Boiling point, −10° C
Percentage fatal in 30 minutes or less, 0 2
Maximum safe concentration, 0 01 percent

Sulphur dioxide has a pungent odor and suffocating effect. It usually comes from the burning of insulation containing sulphur It is very irritating to the eyes and respiratory passages, 1 part in 500 being almost intolerable to breathe, there is occasionally sufficient concentration in the atmosphere to be dangerous It is easily recognized by its characteristic odor, and it causes choking when breathed, as do fumes from burning sulphur Symptoms of poisoning are spasmodic cough, bronchial catarrh, digestive disturbances, and blood-tinged mucous

CARBON MONOXIDE, CO

Inflammable limits in percentage by volume Lower, 12 5; upper, 74
Boiling point, −192° C.
Percentage fatal in 30 minutes or less, 0 5 to 1 0
Percentage causing dangerous illness in ½ to 1 hour, 0 2 to 0 3.
Percentage that can be borne without severe effects for ½ to 1 hour, 0.05 to 0 1
Maximum safe concentration for long exposures, 0 02 percent

Carbon monoxide is a colorless, tasteless gas, and odorless in diffused state It burns with a blue flame in air. It exerts its extremely dangerous action on the body by displacing the oxygen from combination with the hemoglobin Hemoglobin, the coloring matter of the blood, normally absorbs oxygen from the air and delivers it to the tissues through the blood. The affinity of carbon monoxide for hemoglobin is about 300 times that of oxygen. Because of this, even when only a small amount of the poisonous gas is present in the air breathed into the lungs, much of the hemoglobin is locked up in combination with carbon monoxide and so cannot keep up its usual work of carrying oxygen to the tissues. These, because of lack of oxygen, cannot do their work properly. If they are smothered long enough, the tissue cells become damaged, and the injury to the cells may be permanent even if the patient survives.

With increasing concentrations of carbon monoxide, the time required for a given amount of hemoglobin to combine with carbon monoxide decreases very rapidly, until with 1 percent concentration it may require only time enough to take a few breaths to produce a saturation of 60 to 80 percent, which may be fatal.

The symptoms of carbon-monoxide poisoning may be divided into two stages, the first covering the period beginning with normal and

ending in syncope, and the second a depression of the central nervous system beginning in syncope, extending through coma, and ending in apnea.

Stage 1. Tightness across forehead, dilatation of cutaneous vessels, headache (frontal and basal), throbbing in temples, weariness, weakness, dizziness, nausea and vomiting, loss of strength and muscular control, increased pulse and respiratory rates, collapse All of these effects are greatly increased and accelerated with exercise, because of the additional need of oxygen in the tissues Men at rest have often been exposed to carbon monoxide all day without noticing any marked ill effects, but on walking home or exercising have experienced severe symptoms, even to unconsciousness

It is seldom that all of these symptoms are experienced by the same individual. Also, in some cases the poisoning may proceed to the stage of syncope without the victim's feeling any of the subjective symptoms This frequently occurs when the poisoning has been rapid

Stage 2. Increased pulse and respiratory rates, fall of blood pressure, loss of muscular control, especially sphincters, loss of reflexes, coma, usually with intermittent convulsions, Cheyne-Stokes' respiration, slowing of pulse, respiration slow and shallow, cessation of respiration, death.

With a given blood saturation the character and severity of symptoms acquired during exposure depend upon the time required to attain that saturation and the degree of muscular activity—in other words, the extent of oxygen deprivation The number of symptoms decreases with the rate of saturation. With high concentrations the victim may experience but few (weakness and dizziness) of those symptoms given under stage 1. If a given saturation has been acquired by a long exposure to a low concentration, the symptoms and after-effects will be a great deal more severe than if the same saturation has been acquired by a short exposure to a high concentration. Muscular activity increases the number and accentuates the character of the symptoms during exposure, and will bring out latent symptoms after exposure. A person at rest may pass into a state of dizziness and unconsciousness without experiencing any marked previous effects

PREVENTION OF POISONING BY GASES FOUND IN SEWERS AND TREATMENT PLANTS

The National Electrical Safety Code states that a manhole should never be entered "until you have assured yourself that it is free from dangerous gases, by testing with an approved safety lamp, by ventilation, or by other adequate methods." Tests may be made to determine the presence of poisonous or explosive gases. Odors are

important indicators of the presence of many such gases. However, some of them have little or no odor, such as carbon monoxide and hydrogen Inflammable gases may be detected by the Burrell methane indicator, the Martienssen methane detector, and the U. C. C. methane detector.

Deficiency in oxygen and the presence of poisonous gases may be detected by the use of small animals, especially birds Canaries have been found to be best of the live detectors, as they usually show symptoms of distress sooner than other small animals. Yant [7] found that Japanese waltzing mice were of value for this purpose. This same investigator [8] also called attention to the defects of a flame safety lamp for the detection of gasoline fumes, and it would, therefore, not be universally suitable for the detection of gases in sewers and possibly not in sewage-treatment plants A portable apparatus [9] has been developed which will indicate whether an atmosphere is explosive above the explosive limit, deficient in oxygen, or, if below the explosive limit, the approximate percentage of combustibles present. The apparatus is operated, however, so as to give an analysis showing the percentage of the various gases, such as carbon dioxide, oxygen, ethylene, carbon monoxide, hydrogen, methane plus ethane, and nitrogen. This apparatus would not necessarily indicate the toxic properties of the atmosphere. Satisfactory apparatus has been developed especially for detecting small quantities of carbon monoxide, such as the iodine pentoxide indicator, pyrotannic acid apparatus, and palladium chloride ampoules or paper.

Jones (see footnote 2) recommends that sewage tanks be well ventilated before workmen are allowed to enter them for making inspection or repairs. This reason is evident, as the lower inflammable limit may be reached when the concentration of sewage gas is about 5 percent. (See table 1.) There are several types of portable blowers with explosion-proof motors which may be used satisfactorily for ventilating sewage tanks before making inspection or repairs. Jones strongly emphasizes that the ventilation should be continued during the time the workmen are in the tanks, as gases are given off and may reach the lower inflammable limit unless continuously diluted with air. Jones makes the following additional recommendations:

"(1) If illumination is required in the tanks, only flashlights approved by the Bureau of Mines should be used.

"(2) At many sewage-disposal plants the gases are collected and used for heating purposes. The utilization of these gases is attended

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[7] Yant, W P., Patty, F. A., Schrenk, H. H., and Berger, L B : The Response of Japanese Waltzing Mice and Canaries to Carbon Monoxide and to Atmospheres Deficient in Oxygen. R.I 3040, U S Bureau of Mines, Oct., 1930, 12 pp.

[8] Yant, W. P., Barber, L B., and McCaa, G. S.: A New Flame Safety-Lamp Testing and Demonstration Apparatus. R.I. 3017, U S Bureau of Mines, July, 1930, 10 pp

[9] Jones, G. W. and Perrott, G. St. J.: Gases in Manholes: A Survey of a Utility in Boston, Mass. R.I. [illegible], U.S. Bureau of Mines, May, 1931, 16 pp.

with some hazards. Very little trouble should be experienced when the plant is in continuous operation, because the pure gas contains very little oxygen and should be as safe to use as ordinary manufactured gas. However, if the plant is shut down or gas generation stopped, then air may leak into the distribution system and thus produce explosive mixtures

"Of chief importance to prevent the infiltration of air is to keep the entire system under a few inches of water pressure so that leakage will be from the system rather than into it If air can be kept out of the system then explosions will not be possible

"Even under the best operating conditions there may be times when the system will contain some air, especially when first put into operation. Then precautions must be taken to prevent flames from traveling through the distribution mains and causing bad explosions. Sir Humphrey Davy, over a hundred years ago, discovered that fine meshed screens placed around the flame of a miner's lamp would prevent the flame on the inside of the lamp from igniting explosive mixtures of methane in air on the outside. Since that time many uses have been made of this discovery, more especially the arresting of the flames in pipe lines Personally, I think the safety features claimed for screens in systems containing large volumes of gas have been overrated. They are excellent protection for 'stationary' flames as found in a safety lamp or even for flames moving at a slow speed; but for flames given a sufficient length of travel, which in pipes of sufficient size may travel 1,000 feet a second and develop high pressures, several screens in tandem will be required, and even then if the flame has been arrested the high pressure is still present and must be eliminated if damage to the flame trap is to be prevented. Our experience gained last year on another problem, whereby means of preventing damage to industrial equipment from explosive mixtures were investigated, led to the conclusion that release diaphragms are the most satisfactory method of protecting systems containing explosive mixtures. Release diaphragms properly placed and of the right size augmented by water seals and screens should give satisfactory protection to sewage-gas systems. On account of a lack of information on the flame speeds and pressures developed when explosive mixtures of sewage gases are ignited in pipes or other chambers, it is not possible to state definitely how and where the diaphragms should be placed. Information on other explosive mixtures in general permits us to reason by analogy what might be adequate for sewage gases. I might say as a mere speculation that, if release diaphragm openings are installed on the flame trap of a sewage pipe system so that there are 3.5 square feet of release opening per 100 cubic feet of gas, the release opening be 6 inches or larger in diameter, aluminum, lead, or tin foil be used for diaphragm mate-

important indicators of the presence of many such gases However, some of them have little or no odor, such as carbon monoxide and hydrogen Inflammable gases may be detected by the Burrell methane indicator, the Martienssen methane detector, and the U. C. C. methane detector

Deficiency in oxygen and the presence of poisonous gases may be detected by the use of small animals, especially birds Canaries have been found to be best of the live detectors, as they usually show symptoms of distress sooner than other small animals. Yant [7] found that Japanese waltzing mice were of value for this purpose. This same investigator [8] also called attention to the defects of a flame safety lamp for the detection of gasoline fumes, and it would, therefore, not be universally suitable for the detection of gases in sewers and possibly not in sewage-treatment plants. A portable apparatus [9] has been developed which will indicate whether an atmosphere is explosive above the explosive limit, deficient in oxygen, or, if below the explosive limit, the approximate percentage of combustibles present. The apparatus is operated, however, so as to give an analysis showing the percentage of the various gases, such as carbon dioxide, oxygen, ethylene, carbon monoxide, hydrogen, methane plus ethane, and nitrogen. This apparatus would not necessarily indicate the toxic properties of the atmosphere. Satisfactory apparatus has been developed especially for detecting small quantities of carbon monoxide, such as the iodine pentoxide indicator, pyrotannic acid apparatus, and palladium chloride ampoules or paper.

Jones (see footnote 2) recommends that sewage tanks be well ventilated before workmen are allowed to enter them for making inspection or repairs. This reason is evident, as the lower inflammable limit may be reached when the concentration of sewage gas is about 5 percent. (See table 1.) There are several types of portable blowers with explosion-proof motors which may be used satisfactorily for ventilating sewage tanks before making inspection or repairs Jones strongly emphasizes that the ventilation should be continued during the time the workmen are in the tanks, as gases are given off and may reach the lower inflammable limit unless continuously diluted with air. Jones makes the following additional recommendations:

"(1) If illumination is required in the tanks, only flashlights approved by the Bureau of Mines should be used.

"(2) At many sewage-disposal plants the gases are collected and used for heating purposes. The utilization of these gases is attended

[7] Yant, W P, Patty, F. A, Schrenk, H H, and Berger, L B. The Response of Japanese Waltzing Mice and Canaries to Carbon Monoxide and to Atmospheres Deficient in Oxygen. R.I 3040, U S Bureau of Mines, Oct, 1930, 12 pp.

[8] Yant, W P, Berber, L. B., and McCaa, G S · A New Flame Safety-Lamp Testing and Demonstration Apparatus. R I. 3017, U.S. Bureau of Mines, July, 1930, 10 pp

[9] Jones, G. W. and Perrott, G. St. J.. Gases in Manholes: A Survey of a Utility in Boston, Mass. R.I. [illegible], U.S. Bureau of Mines, May, 1931, 16 pp.

with some hazards. Very little trouble should be experienced when the plant is in continuous operation, because the pure gas contains very little oxygen and should be as safe to use as ordinary manufactured gas. However, if the plant is shut down or gas generation stopped, then air may leak into the distribution system and thus produce explosive mixtures.

"Of chief importance to prevent the infiltration of air is to keep the entire system under a few inches of water pressure so that leakage will be from the system rather than into it If air can be kept out of the system then explosions will not be possible

"Even under the best operating conditions there may be times when the system will contain some air, especially when first put into operation. Then precautions must be taken to prevent flames from traveling through the distribution mains and causing bad explosions. Sir Humphrey Davy, over a hundred years ago, discovered that fine meshed screens placed around the flame of a miner's lamp would prevent the flame on the inside of the lamp from igniting explosive mixtures of methane in air on the outside. Since that time many uses have been made of this discovery, more especially the arresting of the flames in pipe lines Personally, I think the safety features claimed for screens in systems containing large volumes of gas have been overrated. They are excellent protection for 'stationary' flames as found in a safety lamp or even for flames moving at a slow speed; but for flames given a sufficient length of travel, which in pipes of sufficient size may travel 1,000 feet a second and develop high pressures, several screens in tandem will be required, and even then if the flame has been arrested the high pressure is still present and must be eliminated if damage to the flame trap is to be prevented. Our experience gained last year on another problem, whereby means of preventing damage to industrial equipment from explosive mixtures were investigated, led to the conclusion that release diaphragms are the most satisfactory method of protecting systems containing explosive mixtures. Release diaphragms properly placed and of the right size augmented by water seals and screens should give satisfactory protection to sewage-gas systems. On account of a lack of information on the flame speeds and pressures developed when explosive mixtures of sewage gases are ignited in pipes or other chambers, it is not possible to state definitely how and where the diaphragms should be placed. Information on other explosive mixtures in general permits us to reason by analogy what might be adequate for sewage gases. I might say as a mere speculation that, if release diaphragm openings are installed on the flame trap of a sewage pipe system so that there are 3.5 square feet of release opening per 100 cubic feet of gas, the release opening be 6 inches or larger in diameter, aluminum, lead, or tin foil be used for diaphragm mate-

rial and not over 0 002 inch in thickness, then the pressure in the flame trap caused by the explosion of any sewage gas-air mixture should not exceed 12 pounds per square inch above atmospheric pressure The installation of two flame traps close together and at the delivery end of the sewage gases, so assembled that the traps may be connected in series or parallel, and each equipped with the proper diaphragm releases, water seals, and screens, should safely prevent flames from traveling through the piping system to the sewage tanks The traps should be equipped with suitable gauges to give the pressure of the gas in the traps and height of the water above the water seals

"Two flame traps are recommended so that in case of trouble in either the gas may be passed through one while the other is being cleaned During normal operation both may be used as an added protection

"It is very important that the water in the seals should be kept at the proper height at all times and screens kept clean, the flame traps be placed in a heated and well ventilated part of the building and protected by an enclosure so the diaphragms are not damaged and that employees may not be burned by flames issuing through the diaphragm openings should an explosion occur"

If it is necessary to enter an atmosphere containing any of the above noxious gases with insufficient ventilation, Katz [10] has recommended the hosemask, especially for manholes The type N canister mask is also satisfactory when the air contains only a small proportion of poisonous gases and sufficient oxygen to support life. The hosemask has the advantage that there is nothing to be changed until the parts become worn out It may be used to a distance of 100 feet. Longer hose, however, is not usually practicable The hosemask with a hand-operated rotary blower delivers the air at the face piece in excess of that necessary to be breathed. It further has the advantage that, should the hose leak, the leak will be outward rather than into the hose. It is obvious that the intake end of the hosemask should be in fresh air.

TREATMENT OF POISONING BY GASES FOUND IN SEWERS AND TREATMENT PLANTS

The steps in effective treatment of acute poisoning by poisonous and noxious gases in sewers and treatment plants are as follows:

1. The victim should be removed to fresh air as soon as possible.
2. If breathing has stopped, or is weak and intermittent, or present in but occasional gasps, artificial respiration by the Schaefer method should be given persistently until normal breathing is resumed, or until after the heart has stopped.

[10] See footnote 8.

3 Circulation should be aided by rubbing the limbs and keeping the body warm with blankets, hot-water bottles, hot bricks or other devices, care being taken that these are wrapped or do not come in contact with the body and produce burns This aids in tiding the body over a period of low vitality Other stimulants, such as hypodermics of caffein, sodium benzoate, or camphor in oil, should not be administered except by a doctor after he has considered the possibility of overstimulation and consequent collapse

4. The patient should be kept at rest, lying down in order to avoid any strain on the heart. Later, he should be treated as a convalescent and given plenty of time to rest and recuperate

5 After-effects of poisoning by such gases should be treated symptomatically.

6. It should be emphasized that inhalation, for a period of 20 to 30 minutes, of oxygen, or a 5 percent mixture of carbon dioxide in oxygen if available, will, when given immediately, greatly lessen the number and severity of symptoms of carbon monoxide poisoning, as well as decrease the possibility of serious sequelae All industries in which this type of poisoning commonly exists should provide apparatus (inhalers) for the efficient administration of these treatments. This apparatus should be placed at points most convenient for treating carbon monoxide poisoning, and employees should be trained in its use so that resuscitation may be effected immediately.

CITY HEALTH OFFICERS, 1933

Directory of Those in Cities of 10,000 or More Population

Directories of the city health officers in the cities of the United States having a population of 10,000 or more have been published in the Public Health Reports [1] for each year from 1916 to 1931 for the information of health officers and others interested in public-health activities These directories have been compiled from data furnished by the health officers. The cities included in this directory are those having populations of 10,000 or more according to the 1930 census.

The asterisk (*) indicates that the officer before whose name it appears has been reported to be a "whole-time" health officer. For this purpose a "whole-time" officer is defined as "one who does not engage in the practice of medicine or in any other business, but devotes all his time to official duties."

[1] Reprints nos 346, 416, 494, 539, 599, 702, 767, 876, 930, 1025, 1103, 1177, 1257, 1333, 1426, and 1521 from the Public Health Reports.

City	Name of health officer	Official title
Alabama		
Anniston	*George A Cryer, M D	County health officer
Bessemer	*J D Dowling, M D	Do
Birmingham	*J D Dowling, M D	Do
Decatur	*Lee Roy Murphree, M D, C P H	Do
Dothan	*F G Cranger, M D	Do
Fairfield		
Florence	*W D Hubbard, M D	Do
Gadsden	*C L Murphree	Do
Huntsville	*W C Hatchett, M D	Do
Mobile	*C A Mohr, M D	Do
Montgomery	*J L Bowman, M D	Do
Phenix		
Selma	*L T Lee, M D	Do
Tuscaloosa	*A A Kirk, M D	Do
Arizona		
Phoenix	George E Shields, M D	City health officer
Tucson	*Lewis H Howard, M D	Director, health unit
Arkansas		
Blytheville	I R Johnson, M D	City health officer
El Dorado	F O Mahony, M D	Do
Fort Smith	*J E Johnson, M D	District health officer
Hot Springs	*James Foster Merritt, M D	City and county health officer
Jonesboro	Ralph M Sloan, M D	City health officer
Little Rock	V T Webb, M D	Do
North Little Rock	Val L Eason, M D, D P H	Do
Pine Bluff		
Texarkana	Harry Eldridge Murry, M D	Do
California		
Alameda	Francis B Galbraith, M D	Health officer and city physician
Alhambra [1]	*S J Stewart, M D	District health officer
Anaheim	*K H Sutherland, M D	Orange County health officer
Bakersfield	P J Cuneo, M D	Health officer
Berkeley	*Frank L Kelly, M D, Dr P H	Health officer and local registrar
Beverly Hills	Charles Frederick Nelson, M D	Health officer
Brawley	John L Parker, M D	Do
Burbank	Thomas H Ransom, M D	Do
Burlingame	Matthew F Desmond, M D	Do
Compton [1]	*J L Pomeroy, M D	County health officer
Eureka	W J Quinn M D	Health officer
Fresno	C Mathewson, M D	Do
Fullerton	*K H Sutherland, M D	Orange County health officer
Glendale [1]	*F A Wilmot, M D, D P H	District health officer
Huntington Park [1]	*George M Malkin, M D	Do
Inglewood [1]		
Long Beach	*Grundy E McDonald, M D	City health officer
Los Angeles	*Charles W Decker, M D	Health officer
	*George M Stevens, M D	Epidemiologist and first assistant health officer
	Divisional directors	
	*Chas G Wharton, M D	Second assistant health officer
	*Louis J Petritz, M D	Assistant health officer and director of inspections
	*Harry Cohn, M D	Director of tuberculosis
	*Agnes M Talcott	Director of nurses
	*C B Leasure	Chief clerk
	*F W Peterson	Director of vital statistics.
	*John Carman	Chief chemist
	*Mona Bettin, M D	Chief bacteriologist
	*F D Sweger	Director of housing and sanitation
	*William Veit, D V M	Director of milk and meat inspection
	*A M Rogers, M D	Director, venereal clinic (male).
	*Emily F Balcom, M D	Director, venereal clinic (female).
	*Lyle McNeile, M D	Director, maternity division.
	*C K Stewart	Director of rodent division
	*J M Cain	Director of quarantine and morbidity divisions
	*L V Dieter, D of Phar	Director of laboratories
	*W E Hopkins, D V	Chief, meat inspection division
	*Lillian Kositza, M D	Director, child hygiene division
Modesto	*E F Reamer, M D	Stanislaus County health officer
Monrovia [1]	*J M Furstman, M D	District health officer
Oakland	*A. Hieronymus, M D	Health officer
Ontario	Calvert L Emmons, M D	City health officer
Palo Alto	*Louis Olsen, S E	Health officer.
Pasadena	*J D Dunshee, M D	Do
Pomona [1]	*M U Stoneman, M D	District health officer
Redlands	Harold G Gentry, M D	Secretary, board of health.
Richmond	Charles Robert Blake, M D	Commissioner of health
Riverside	*William B Wells, M D	Do
Sacramento	*Herbert F True, M.D	City health officer
Salinas	*Marie K Fidel, R.N	Do

[1] Under supervision of Dr. J. L Pomeroy, health officer of Los Angeles County, Hall of Justice, Los Angeles, Calif

City	Name of health officer	Official title
California—Continued		
San Bernardino	Walter D Lenker, M D	City health officer
San Diego	*Alex M Lesem, M D	Director of health
San Francisco	Health advisory board	
Department of public health—	Laurence Arnstein, Chairman.	
	Howard Adler, M D	
	Frank J Elimin	
	T J Lenehan	
	F H McKavitt, D D S	
	J W Ward, M D	
	W W Wymore, M D	
	*J C Geiger, M D	Director of public health
	*Jacques P Gray, M D	Assistant director of public health
	C M Wollenberg	Director of institutions—Superintendent, Laguna Honda Home
	L M Wilbor, M D	Superintendent, San Francisco Hospital
	Myra W Kimball	Superintendent, Hassler Health Home
	Edmund Butler, M D	Chief surgeon, Emergency Hospital Service
	George K Rhodes, M D	Assistant chief surgeon, Emergency Hospital Service
	James I O'Dea	Chief steward, Emergency Hospital Service
	P R Hennessy	Senior accountant
	Ed M Coffey	Chief clerk
	George H Becker, M D	Director, bureau of communicable diseases
	R W Burlingame, M D	Resident physician, isolation division, San Francisco Hospital, and director division of venereal disease control
	W R P Clark, M D	Director, division of tuberculosis control
	Paul S Barrett, M D	Director, bureau of child hygiene
	Ernestine Sschwab	Director of field nursing
	R Grosso, D D S	Chief dental surgeon
	Olga Bridgman, M D	Chief, division of mental hygiene
	T P Lydon	Director, bureau of food and milk.
	J J Burke	Chief, food inspection
	B Q Engle	Chief, pasteurizing plant inspection.
	C G Hansen	Chief, meat and market inspection.
	G A Melody, D V M	Chief, dairy inspection
Bureau of public health engineering—	A B Crowley	Chief, industrial hygiene division.
	H P Thyle	Chief, housing inspection division
	W. D Hobro	Chief, plumbing inspection division.
Laboratories—	Annie D MacRae, M D	Director of laboratories
	Clinton Davis	Chief chemist
San Jose	*Henry C Brown, M D	Health officer
San Leandro	Luther Michael, M D	City health officer
San Mateo	W C McLean, D V M	Health officer
Santa Ana	*K H Sutherland, M D	Orange County health officer.
Santa Barbara	*William H Eaton, M D	Health officer
Santa Cruz	John T Harrington, M D	City health officer
Santa Monica [1]	*Wm F Reasner, M D	District health officer
Santa Rosa	*E J Helgren, B S Ch, B S B	City health officer
South Gate [1]	*Hal E Hazel	Health officer
South Pasadena	Edward James Johnston, M D	Do
Stockton	*John J Sippy, M D	District health officer
Vallejo	E A Peterson, M D	Health officer
Ventura	J. A De Serpa, D V M	Do
Whittier [1]	*F G Crandall, M D	District health officer
Colorado		
Boulder	*H L. Morency, Ph B, D V.M	Director of public health and sanitation
Colorado Springs	Omer R Gillett, M D	Health officer
Denver	*F W Bailey	Manager of health and charity
Fort Collins	T C Taylor, M D	Health officer
Grand Junction	E H Munro, M D	City physician
Greeley	W A Schoen, M D	Do
Pueblo	*W E Buck, M D	Chief, department of health, sanitation and inspection
Trinidad	O F Adams, M.D	City physician
Connecticut		
Ansonia	William H O'Neil, M D	Health officer
Bridgeport	*Richard O'Brien Shea, M D	Health officer and registrar of vital statistics
Bristol	Benjamin B Robbins, M D	City health officer
Danbury	James F Young, M D	Health officer
Derby	Thomas F Plunkett, M.D	Do
East Hartford		
Enfield	Frank F Simonton, M D	Do

[1] Under supervision of Dr J. L. Pomeroy, health officer of Los Angeles County, Hall of Justice, Los Angeles, Calif.

City	Name of health officer	Official title
Connecticut—Continued		
Fairfield	*Lawrence E Poole, M D, Dr P H	Health officer and school physician.
Groton	Frank W Hewes, M D	Health officer
Hamden	George H Joslin, M D	Do
Hartford	*Charles P Botsford, M D	Superintendent of health
Manchester	D C Y Moore M D	Chairman, board of health
Meriden	Joseph A Cooke, M D	Health officer
Middletown	John H Mountain, M D, D D S	Do
Milford		
Naugatuck		
New Britain	*Louis J Dumont, M D	Superintendent of health
New Haven	——— ———, M D	Health officer
New London	*Benjamin N Pennell, D V S	Do
Norwalk	Robert E Perdue, M D	Do
Norwich	Harrison Gray, M D	City health officer
Shelton	Francis I Nettleton, Ph B, M D	Health commissioner
Stamford	R D Fear, M D, Dr P H	Do
Stonington	William D Veil, M D	Health officer
Stratford	De Ruyter Howland, M D	Town health officer
Torrington		
Wallingford		
Waterbury	Edward J Godfrey, M D	Health officer
West Hartford	*Theodore Frank Foster, M D, M P H	Superintendent of health
Willimantic	N Spector, M D	City health officer
Delaware		
Wilmington	Fred F Armstrong, M D	Secretary, board of health
District of Columbia		
Washington	*William C Fowler, M D	Health officer
	*Edward J Schwartz, M D	Assistant health officer
	*Arthur G Cole	Chief clerk and deputy health officer
Bureau of preventable diseases	*James G Cumming, M D	Director
Medical inspection of schools	*Joseph A Murphy, M D	Do
Food inspection	*Reid R Ashworth, D V S	Do
Sanitary inspection	*J Frank Butts, LL B	Do
Vital statistics	*John H Milligan	Do
Chemical laboratory	*John B Reed	Do
Bacteriological laboratory	*John E Noble	Do
Serological laboratory	*Jesse P Porch, D V M	Do
Microanalytical laboratory	*Edwin R Donaldson	Do
Child welfare and hygiene service	*Hugh J Davis, M D	Do
Pound	*Walter R Smith	Poundmaster
Florida		
Daytona Beach	*Harry L Richardson	Health officer
Gainesville	W Lassiter M D	City health officer
Jacksonville	*N A Upchurch, M D	Do
Key West	H C Galey, M D	Do
Lakeland		
Miami	*John W Shisler, M D	Director of public welfare
Orlando		
Pensacola	*W A McPhaul, M D	Director of health unit
St Augustine	H E White, M D	City and county health officer.
St Petersburg	Claude B Wright, M D	City physician
Sanford	J N Tolar, M D	Do
Tallahassee	*L J Graves, M D	Leon County health director
Tampa	*J R McEachern, M D	City health officer
West Palm Beach	*W E Van Landingham, M D	Do
Georgia		
Albany	*Hugo Robinson, PhG, M D	Commissioner of health
Athens	*Wedford W. Brown, M D	Health commissioner, city and county
Atlanta	*John P Kennedy, M D	City health officer
Augusta	*Henry Grady Callison, M D	Commissioner of health
Brunswick	*H L Akridge, M.D, D P H	Do
Columbus		
Decatur		
Griffin	*William Clayton Humphries, M D	Do
Lagrange	*S C Rutland, M D	Health officer
Macon	*J D Applewhite, M D	Do
Rome	*B V. Elmore, M D	Commissioner of health.
Savannah	*Victor H Bassett, M D	City health officer
Thomasville	*H B Jenkins, M.D, M S P H.	Health commissioner.
Valdosta	*Gordon T Crozier, M D., D.P H	Commissioner of health.
Waycross	*Geo E Atwood, M.D, D P H	Do
Idaho:		
Boise	*W H Rhodes	Health officer
Pocatello	*Ross F. Garrett	Public health engineer.

City	Name o health officer	Official title
Illinois		
Alton	Roy W Merkle, M D	Health commissioner
Aurora	Geo W Haan, M D	Do
Belleville	*Frank T Kern	Health officer
Berwyn	*Edward J Farrell, M D	Health director
Bloomington	B Markowitz, M D	Do
Blue Island	*L A Burkhart	Commissioner of health
Brookfield	Walter E Baus, Ch E	Health commissioner
Cairo	C L Weber, M D	Health officer
Calumet City	E S O'Brien, Ph G, Dr P H	Health commissioner
Canton	C J Johnston, M D	President, board of health
Centralia	H E Wilson, M D	City health officer
Champaign	C George Appelle	Do
Chicago	*Herman N Bundesen, M D	President, board of health
	H O Jones, M D	Director, medical service
	Louis E Schmidt, M D	Secretary
	F O Tonney, M D	Director, technical service and research
Bureau of communicable diseases	Isaac D Rawlings, M D	Chief of bureau
Bureau of child welfare	Henry C Niblack, M D	Do
Bureau of laboratories and research	John L White, M D	Do
Bureau of public health engineering	Joel I Connolly	Do
Bureau of dairy products	Henry C Becker, M D V	Do
Bureau of food inspection	J P Kilcourse	Do
Chicago Heights	A H Pannenborg, M D	Health commissioner
Cicero	*Frank J Pokorney, M D, Ph G	Commissioner of health
Danville		
Decatur	*William M Talbert, M D	City physician
East Moline	J Henry Fowler, M D	Health officer
East St Louis	*Albert P Lauman	Commissioner of health
Elgin	*A L Mann, M D (address, Executive Officer, Health Department)	City physician and executive officer.
Elmhurst	A L Mathis, M D	Health commissioner
Elmwood Park	*Mrs Laura Arney	President, board of health.
Evanston	*John W H Pollard, D L, M D	Commissioner of health.
Forest Park	Wm C Masslow, M D	Do
Freeport	K B Rieger, M D	Do
Galesburg	Edgar D Wing, M D	Do
Granite City	*A M Jennings	Mayor and chairman of board of health
Harrisburg	Charles Walden, M D	City physician
Harvey	M R Morse, M D	Health officer
Highland Park		
Jacksonville		
Joliet	*Lloyd B Andrew, M D	Health commissioner.
Kankakee	Joseph A Guertin, M D	City health officer
Kewanee	H N Heflin, M D	Commissioner of health
La Grange	T C McDougal, M D	Village health officer.
La Salle	*Arlington Ailes, M D, C P H	Health commissioner.
Lincoln		
Mattoon	Lowell Arthur Neal, M D	Commissioner of health.
Maywood	Robert L Reynolds, M D	Do
Melrose Park	E G Brust, M D	Health officer
Moline	*A C Stouffer	Do
Mount Vernon	William G Parker, M D	City physician
Oak Park	Frank S Needham, M D	Commissioner of health
Ottawa	E P Hatheway, M D	City health officer
Park Ridge	M W Caveney, M D	Health commissioner.
Pekin	Nelson A Wright, Jr, M D	City health officer
Peoria	E A Garrett, M D	Health commissioner
Quincy	*H O Collins, M D	Public health officer
Rock Island	*Otto Preister	Health officer
Rockford	*Norman C Bullock, M D	Commissioner of health
Springfield	C W Milligan, M D	Superintendent of health.
Sterling	Walter I Carolus, M.D	Health officer
Streator	Theresa K Jennings, M D	President, board of health.
Urbana	W L Veirs, M D	Chairman, board of health.
Waukegan	*Edward Cliff	City health officer
West Frankfort	Wm T Fife	Do
Wilmette	Martin H Seifert, Ph G., M D	Commissioner of health.
Winnetka	*Howard A Orvis, M D., M S in P.H	Health officer
Indiana		
Anderson	E M Conrad, M D	Secretary, city board of health.
Bedford	*Chas Blackburn	Health commissioner
Bloomington	R A De Motte, M D	Secretary, city board of health.
Connersville	Herman W Smelser, M.D	City health officer
Crawfordsville	Fred N. Daugherty, M.D	Secretary, board of health.
East Chicago	Joseph A. Teegarden, M D	Do.
Elkhart	I J. Markel, M.D	Do
Elwood	Frank V Newcomer, M D	Do
Evansville	L. E. Fritsch, M D	Do

City	Name of health officer	Official title
Indiana—Continued		
Fort Wayne	Carl G Miller, M D	Health commissioner and secretary, board of health
Frankfort	A G Chittick, M D	Secretary, board of health
Gary	Walter M Behn, M D	Do
Goshen	Geo A Whippy, M D	City health officer
Hammond	Julius A Chevigny, M D	Commissioner of health
Huntington	R F Frost, M D	Secretary, board of health.
Indianapolis	*Herman G Morgan, M D	Do
Jeffersonville	Samuel L Adair, M D	Do
Kokomo	W J Marshall, M D	Do
La Fayette	M M Lairy, M D	Do
La Porte	Jon Nelson Kelly, M D	Health officer
Logansport	*Louis P Deuner	Health inspector
Marion	L H Eshleman, M D	Secretary, board of health
Michigan City	L M Robrock, M D	Health officer
Mishawaka	M D Wygant, M D	Secretary, board of health
Muncie	J H Williams, M D	Do
New Albany	Anna I McKamy, Ph D , M D	Do
Newcastle	Walter M Stout, M D	Do
Peru	W H Wagoner, M D	Do
Richmond	M F Johnston, M D	Commissioner of health
Shelbyville	Walter C McFadden, M D	Secretary, city board of health.
South Bend	J B Berteling, M D	Do
Terre Haute	Amos H Caffee, M D	Do
Vincennes	Robert S Moore, M D	Do
Whiting	B B Reeve, M D	Do
Iowa		
Ames	C A Aplin, M D	Health officer
Boone	William Woodburn, M D	Do
Burlington	*Finis Suggett, M D	County health officer
Cedar Rapids	Thomas F Suchomel, M D	City physician
Clinton	Leslie K Fenlon, Ph G , M D	City health officer
Council Bluffs	Raymond M Rice, M D	Do
Davenport	*A B Kuhl, Jr , M D	Director of public health.
Des Moines	H E Ransom, M D	Commissioner of health
Dubuque	Walter J Connell, M D , M P H	Health director
Fort Dodge	*Tom Riordan	Sanitary police
Fort Madison	Harold F Noble, M D	City physician
Iowa City	Isom A Rankin, M D	City health officer
Keokuk	Charles A Dimond, M D	Physician to board of health
Marshalltown	R S Grossman, M D	Health officer
Mason City	C M Franchere, M D	City health director
Muscatine	Rodney M Arey, M D	City health officer
Newton	M R Hammer, M D	City physician
Oskaloosa	Oscar J Du Bois, D O	Health officer
Ottumwa		
Sioux City	*W S Petty, M D	Health commissioner
Waterloo	J E Ridenour, M D	Health officer
Kansas		
Arkansas City	P F Theis, M D	City health officer
Atchison	William K Fast, M D	County health officer.
Chanute	James A Butin, M D	City health officer
Coffeyville	P S Townsend, M D	Do
Dodge City	C L Hooper, M D	City physician
Eldorado	L C Murray, M D	County health officer
Emporia	*C H Munger, M.D	Do.
Fort Scott	C L Mosley, M D	City health officer
Hutchinson	Guy R Walker, M D	City physician
Independence	Stephen Flatt, M D	Do
Kansas City	*S David Henry, M D	Director of health
Lawrence	E R Keith, M D	City health officer
Leavenworth	A L Suwalsky, M D	City physician and health officer
Manhattan	J R Mathews, M D	County and city health officer
Newton	M C Martin, M D	County health officer
Parsons	M C Ruhle, M D	City physician and health officer
Pittsburg	C Mart Montes, M D	City health officer
Salina	S T Blades, M D	Do
Topeka	*F P Helm, M D	Do
Wichita	*Russell E Hobbs, M D	Director of public welfare
Kentucky.		
Ashland	*R D. Higgins, M D	Director, Boyd County Health Department
Bowling Green	*George M Wells, M D	Director, Warren County Health Department
Covington	James P Riffe, M D	Health officer
Fort Thomas	Frank H Southgate, M D	Do.
Frankfort		
Henderson	*Robert K Galloway, M.D , M P.H	County health officer
Hopkinsville	Philip E Haynes, M D	City health officer.
Lexington	*Dennis A Furlong	Acting health officer
Louisville	C. H Harris, M D	Director of health.
Middlesboro		
Newport	John Todd, M.D	City health officer.

City	Name of health officer	Official title
Kentucky—Continued		
Owensboro	*L Hubert Medley, M D	Daviess County health officer
Paducah	Palmer H Reed, M D	City health officer
Louisiana		
Alexandria	R B Wallace, M D, and W L Murrell, M D	President, board of health
Baton Rouge	T Jeff McHugh, M D	City health officer
Bogalusa	Joseph H Slaughter, M D	City physician
Lafayette	M R Cushman, M D	Health officer
Lake Charles	W P Bordelon, M D	President, board of health
Monroe	D I Hirsch, M D	Do
New Orleans	*William Henry Robin, M D	Superintendent of public health.
Shreveport	*John H Cannon, M D	Do
Maine		
Auburn	E Leathers, M D	Health officer
Augusta	George A Coombs, M D	Do
Bangor	*Harry D McNeil, M D	Local health officer
Bath	Joseph I Smith, M D	Health officer and milk inspector.
Biddeford	*John W Mahoney	Local health officer
Lewiston	*Robert J Wiseman, Jr, M D	Health officer
Portland	*Thomas Tetreau, M D	City health officer
Sanford	*William Henry Kelly, M D	Local health officer.
South Portland		
Waterville	*Arthur R Daviau, M D	Health officer
Westbrook	Patrick H Welch	Local health officer
Maryland		
Annapolis	James J Murphy, M D	City health officer
Baltimore		
Administration	*Huntington Williams, M D, Dr P H	Commissioner of health
	*J Frederick Hempel, M D	Assistant commissioner of health.
	*Harry S Mustard, M D	Health officer, eastern health district.
Medical section		
Bureau of communicable diseases	*Adolph Weinzirl, M D	Epidemiologist
Bureau of venereal diseases	*Ferdinand O Reinhard, M D	Director
Bureau of tuberculosis	Bartus T Baggott, M D	Do
Bureau of child welfare	*William H F Warthen, M D	Do
Division of school hygiene	H Warren Buckler, M D	Chief
Dental clinics	Morris Cramer, D D S	Supervisor
Bureau of laboratories	*C Leroy Ewing	Director
Bureau of public health nursing	*Jane B Laib, R N	Do
Sydenham Hospital	*Myron G Tull, M D	Superintendent
Sanitary section	*R S Craig	Director
Bureau of food control	*Ferdinand A Korff	Do
Bureau of milk control	*John A Lescure	Do
Bureau of environmental hygiene	*Wilmer H Schulze, Phar D	Do
Bureau of meat inspection	*William Brenner, V D	Chief
Cumberland	*Harvey H Weiss	Health officer and registrar of vital statistics
Frederick	*E C Kefauver, M D	City and county health officer.
Hagerstown	*W R Cameron, M.D	Do
Salisbury	*S H Hurdle, M D	Deputy State health officer.
Massachusetts		
Adams	James F McLaughlin, M D	Chairman, board of health.
Amesbury	Clarence S Morse	Agent, board of health
Arlington	*William H Bradley	Agent and clerk, board of health.
Athol	Marion B Sitlev, M D	Secretary, board of health.
Attleboro	William O Hewitt, M D	Health officer
Belmont	*Thomas F Harris	Agent, board of health
Beverly	*Alonzo O Woodbury	Clerk and agent, board of health.
Boston	*Francis X Mahoney, D V M, M D	Health commissioner.
	*Joseph A Cahalan	Secretary.
Divisions—		
Medical	*M Victor Safford, M D	Deputy commissioner
Communicable diseases	*Frederick J Bailey, M D	Do
Bacteriological laboratory	*Karl R Bailey, M D	Do.
Food	*P H Mullowney, D V M	Do
Child hygiene	Charles F Wilinsky, M D	Do
Sanitary	*M Victor Safford, M D	Acting deputy commissioner.
Tuberculosis	*George O'Donnell, M D	Deputy commissioner.
Vital statistics	*Joseph W Monahan	Do
Braintree	Frank E Stronach	Agent, board of health.
Brockton	David B Tuholski, M D	Health officer
Brookline	Francis Parkman Denny, M D	Do
Cambridge	*S B Kelleher, M D	Medical inspector.
Chelsea	*John F Welch	Health officer
Chicopee	*Gertrude M. DeWitt	Agent, board of health.
Clinton	*Frederick E. Murphy	Health officer.

City	Name of health officer	Official title
Massachusetts—Continued		
Danvers	*Hogo Nappe, R N	Health officer and milk inspector
Dedham	Thomas J Breman	Health inspector
Easthampton	C C Buckner	Agent, board of health
Everett	*William F Hogan	Do
Fairhaven	*W F Delano	Executive officer
Fall River	*Earnest M Morris, M D	Health commissioner
Fitchburg	*Fred R Brigham	Agent, board of health
Framingham	*David Moxon, B Sc in Bacteriology, C P H	Do
Gardner	*William P O'Donnell	Do
Gloucester	George S Rust, M D	Physician to board of health
Greenfield	*George P Moore	Agent, board of health
Haverhill	*George T Lennon	Clerk and agent, board of health
Holyoke	*Daniel P Hartnett, Ph G	Health officer
Lawrence	*Daniel J Costello	Clerk, board of health
Leominster	Hugh E Crain	Agent, board of helath
Lowell	*John J McNamara, M D	Director of health
Lynn	Walter L Burns, M D	Commissioner of health
Malden	*May C Welsh	Secretary and agent, board of health
Marlborough	*John J Cassidy	Agent, board of health
Medford	William N Lanigan, M D	Medical inspector
Melrose	Clarence P Holden, M D	Chairman, board of health
Methuen	John Oddy, M D	Board of health physician
Milford		
Milton		
Natick	Thomas F Morris	Agent, board of health
Needham	*G Donald Buckner, S B in P H	Health officer
New Bedford	*Wm G Kirschbaum	Agent and executive officer
Newburyport	*Wilbur N O'Brien, Ph G	Agent, board of health
Newton	*Francis Geo Curtis, M D	Chairman, board of health
North Adams	*Douglas W Hyde, S E	Agent, board of health
North Attleboro	Daniel J Kiley, M D	Health officer
Northampton	*George R Turner	Agent, board of health
Norwood	John A Shannon	Do
Peabody	*Percy F Murray	Do
Pittsfield	*Willys Merritt Monroe, M D	Health officer
Plymouth	Walter D Shurtleff, M D	Do
Quincy	Edmund B Fitz Gerald, M D	Commissioner of health
Revere	Francis Licata, M D	Chairman, board of health
Salem	*John J McGrath	Agent, board of health
Saugus	Henry C Westendarp	Chairman, board of health
Somerville	*Frank L Morse, M D	Medical inspector and bacteriologist.
Southbridge	Albert R Brown	Agent, board of health
Springfield	*Jacob R Sackett	Agent and health officer
Stoneham	*George A Hinchcliffe	Secretary, health officer
Swampscott	*Clarence W Horton	Health officer
Taunton	Andrew J Leddy, M D	Chairman, board of health
Wakefield	David Taggart	Health officer and agent
Waltham	*Joseph T Mulcahy	Director of public welfare
Watertown	*Fred W Bodge	Agent, board of health
Webster	Wilfred P Bazinet, D D S	Health officer
Wellesley	Curtis M Hilliard	Supervisor of health
West Springfield	J J Lysaght	Agent, board of health
Westfield	Robert M Marr, M D	Chairman, board of health
Weymouth	F L Doucett, M D	Clerk, board of health
Winchester	*Maurice Dineen	Agent, board of health
Winthrop	*William D Childress	Health officer
Woburn	*Edward F Gorman	Agent and secretary, board of health
Worcester	*Peter Owen Shea, M D	Director of public health and school hygiene
Michigan		
Adrian	W S Mackenzie, M D	Health officer and city physician
Alpena	F J O'Donnell, M D	Health officer
Ann Arbor	John A Wessinger, M D, Dr P H	Do
Battle Creek	*A A. Hoyt, M D	Health officer and registrar
Bay City	G W Moore, M D	Health officer
Benton Harbor	Edwin Roy Taylor, M D	Director of public health
Dearborn	C A Christensen, M D	Commissioner of health and sanitation
Detroit	Board of health	
	Gustavus D Pope	President
	William M Walker	Vice president
	William A Evans, M D	
	L O Geib, M D	
	Executive staff, department of health	
	*Henry F Vaughan, Dr P H	Commissioner of health.
	Bert U. Estabrook, M D	Deputy Commissioner
	*Fred M Meader, M D	Deputy commissioner and medical director
	*John F Norton, Ph D	Director of laboratories
	*Don W. Gudakunst, M D	Director, school health service
	A. C. Thompson, D D.S	Director of school dental service.
	*Miss Grace Ross, R.N	Superintendent of nursing.

City	Name of health officer	Official title
Michigan—Continued	Executive staff, department of health—Continued	
Detroit	Ward F Seeley, M D	Director of Herman Kiefer Hospital, maternity division
	Russell W Alles, M D	Director of prenatal division
	*Major John F Roehl	Director of special investigation
	*R S Dixon, M D	Director of division of venereal diseases
	*Henry D Chadwick, M D	Tuberculosis controller
	*B H Douglas, M D	Superintendent of William H Maybury Sanatorium
	*George E Phillips	Superintendent of Herman Kiefer Hospital
	*F Gardner Legg, C E	Director of sanitary engineering
	*Edward C Schultz	Director of dairy and food inspection.
	*Arthur P Derby, M D	Director of division of tuberculosis
	Don J Barnes, M D	Director of division of child welfare
	*G Arthur Blakeslee	Director of division of vital statistics
	*H Wellington, Yates, M D	Director of division of cancer control
	*John E Gordon, M D	Medical epidemiologist of Herman Kiefer Hospital
Ecorse	Lawrence H Van Becelaere, M D	Health officer.
Escanaba		
Ferndale	Willard G Beattie, M D	Do
Flint	*Kenneth B Moore, M D	Do
Grand Rapids	*Allison H Edwards, M D	Do
Grosse Pointe	*Benjamin H Warren, M D	Health commissioner
Hamtramck	Charles R Sheridan, M D	Do
Highland Park	George M Livingston, M D	Health officer and city physician
Holland	Wm Westrate, M D	Health officer
Iron Mountain	J L Browning, M D	Do
Ironwood	C C Urquhart, M D	City health officer
Jackson	*Floyd Raymond Town, M D	Health officer
Kalamazoo	*John L Lavan, M D	Director of public health.
Lansing	*E R Van der Slice, M D	Health officer
Lincoln Park	H K Butterworth, M D	Do
Marquette	*T R Laughbaum, M D	City health officer
Menominee	John T Kaye, M D	Health officer
Monroe	Wm F Acker, M D	Do
Mount Clemens	W S Kane, M D	Do
Muskegon	M E Stone, M D	Do
Muskegon Heights	O M La Core, M D	Do
Niles	Roy S Waterson, M D	Do
Owosso	Walter E Ward, M D	Do
Pontiac	*Hubert M Heitsch, M D	Director of public health.
Port Huron	A L Callery, M D	Health officer
River Rouge	Harvey S Broderson, M D	City health officer
Royal Oak		
Saginaw	*Frank A Poole, M D	Health officer
Sault Ste Marie	E A Cornell, M D	Do
Traverse City	George A Holliday, M D	Do
Wyandotte	Earl H Engel, M D	Do
Ypsilanti	D N Robb, M D	Do
Minnesota		
Albert Lea	D S Branham, M D	Do
Austin	Jay K McKenna, M D	Do
Brainerd	V E Quanstrom, M D	City health officer
Duluth	*M McC Fischer, M D	Director of public health.
Faribault	Frederick U Davis, M D	Health commissioner
Hibbing	*H A Weinick, M D	Chairman, board of health.
Mankato	W A Beach, M D	Health officer
Minneapolis	*Francis E Harrington, LL D, M D	Commissioner of health
Rochester	C H Mayo, M D [1]	Health officer
St Cloud	H. W Goehrs, M D	City physician
St Paul	*Benjamin F Simon, M D	Chief health officer
South St. Paul	O S Ely, M D	Commissioner of health.
Virginia	J Arnold Malmstrom, M D	Health officer
Winona	William V Lindsay, M D	Do
Mississippi		
Biloxi		
Clarksdale	*Vernon Baker Harrison, M D	Director, county health department.
Columbus	C. E Lehmberg, M D	County health officer
Greenville	*John W. Shackleford, M D, M P H	Director, county health department.
Greenwood	*Levi A Barnett, M D	Director of health.
Gulfport		
Hattiesburg	*B D Blackwelder, M D, C.P.H	Health officer.
Jackson	*W E. Noblin, M D	Director, county health department.
Laurel	L R. Beech, M D	Health officer
McComb		
Meridian	*D V Galloway, M D, M.P H.	Director, county health department.
Natchez	*Loren Wallin, M D	Do
Vicksburg	*F. Michael Smith, M.D	Do.

[1] D. C. Lockhead, M.D., D P H, deputy health officer, full time.

City	Name of health officer	Official title
Missouri		
Cape Girardeau	*H Haman, Jr.	Health officer
Columbia	*W A Norris, M D	Health commissioner
Hannibal	*E M Lucke, M D	Health officer
Independence	F L Cook, M D	City physician
Jefferson City	James G Bruce, M D	Do
Joplin	A Benson Clark, M D	Commissioner of health and sanitation
Kansas City	Jabez N Jackson, LL D , M D	Health director
Maplewood	Pierre M Brossard, M D	Health commissioner
Moberly	C C Smith, M D	City health officer
St Charles	Will L Freeman, M D	Do
St Joseph	A J Smith, M D	Health officer
St Louis	*Jos F Bredeck, M D , D P H	Health commissioner
	*Paul J Zentay, M D	Assistant health commissioner.
	*W Scott Johnson	Sanitary engineer
	*H I Spector	Tuberculosis controller
	*Joseph C Willett, D V M	Chief of laboratories
	*John S Koen, D V S	Chief of food control
	*Ernest C McCulloch, D V M	Milk controller
	*Walter E Cook	Field supervisor
	*Harry M Stamm, D D S	Dental supervisor
	*A L Kavanagh, M D	Chief of venereal clinic
	*Mildred Sanderson, R N	Municipal nurses' supervisor
	*J Atkinson Smith, M D	Chief, communicable disease section.
	*Leon Grosch	Librarian, vital statistics section
		Epidemiologist
	*Milton R Fisher, D V M	Chief veterinary milk inspector
	*W C Dillard, D V M	Veterinary meat inspector
	*H V Persells, D V M	Assistant veterinary milk inspector
	*Henry A Faust, D V M	Veterinarian
	*C B Michel, D V M	Veterinary meat inspector
	*Downey L Harris, M D	Rabies controller
Sedalia	*J H Brooks	Sanitary officer
Springfield	*Ralph W Langston	Commissioner of health and sanitation
University City	O P Hampton, Jr , M D	Health commissioner
Webster Groves	Carl C Irick, M D	Do
Montana		
Anaconda	John J Malee, M D	City physician
Billings	E G Balsam, M D	Secretary, board of health
Butte	J J Kane, M D	City physician
Great Falls	*F L Watkins, M D	City and county health officer.
Helena	*William Copenhaver, Jr , M D	City health officer
Missoula	*Frank D Pease, M D	City and county health officer.
Nebraska		
Beatrice	Roy Noble, M D	City physician
Fremont	J S Devries, M D	Do
Grand Island	W M Wheeler	City engineer
Hastings	E J Latta, M D	City physician
Lincoln	M F Arnholt, M D	Superintendent of health
Norfolk	V L Seman, M D	Secretary, board of health
North Platte	J B Redfield, M D	City physician.
Omaha	*Millard Langfeld, M D	Director of public health.
Nevada		
Reno	A F Adams, M D	Secretary, board of health.
New Hampshire		
Berlin	*Eli A Marcoux, B S in Ch E	Health officer and milk inspector.
Claremont	William P Prescott	Health officer
Concord	*Travis Pollard Burroughs, M D., C P H	Sanitary officer.
Dover	*William E Whiteley	Executive officer.
Keene	*Fred C Nims	Health officer
Laconia	E J Gage, M D	Do
Manchester	*Howard A Streeter, M D	Do
Nashua	Deering G Smith, M D	Chairman, health department
Portsmouth	Frederick S Gray, M D	City physician, inspector, and bacteriologist.
Rochester	Charles E Goodwin	Health officer
New Jersey.		
Asbury Park	*Budd H Obert	Health officer and registrar of vital statistics
Atlantic City	Samuel L Salasin, M D	Health officer
Bayonne	William W Brooke, M D	Do
Belleville	*Eugene T Berry	Do
Bloomfield	*Joseph C Saile, D O	Health officer-secretary.
Bridgeton	*John G. Robbins	Sanitary inspector
Burlington	*Mrs Kathryn C Phillips	Health officer
Camden	*A L Stone, M D	Director of public health.
Carteret		
Cliffside Park	Fred J. Dyer	Health inspector.
Clifton	Jeremiah P. Quinlan	Health officer.
Collingswood	Harold K Eynon, M.D	Do
Dover	*John G. Taylor	Do.
East Orange	*Frank J. Osborne	Health officer and registrar.

City	Name of health officer	Official title
New Jersey—Continued		
Elizabeth	*Louis J Richards, B S in S E	Health officer
Englewood	*H R H Nicholas	Do
Garfield	Charles B Bleasby, M D	Do
Gloucester City	J Alonzo Beek, M D	Do
Hackensack	*L Van D Chandler	Do
Harrison	*John T McClure	Do
Hawthorne	William Missouellie, M D	Do
Hoboken	J F X Stack, M D	Commissioner of health
Irvington	*William S Bailey	Acting health officer
Jersey City	*James J Hagan	Health officer
Kearny	*Amos Field, Jr	Do
Linden	*Maidie E Noe	Do
Lodi	H H Brevoort, M D	Health inspector
Long Branch	*R C Errickson	Health officer
Millville	Richard H Knowles, Ph G	Do
Montclair	*Carl T Pomeroy, C P H	Do
Morristown	*John F Kilkenny	Do
New Brunswick	E Irving Cronk, M D	Health officer and registrar of vital statistics
Newark	*Charles V Craster, M D, D P H	Health officer
Nutley	*Eugene H Sullivan	Health officer and registrar
Orange	*Lenore Young Wylie, R N	Health officer and registrar of vital statistics
Passaic	John N Ryan, M D	Health officer
Paterson	*Frederick P Lee, M D	Do
Perth Amboy	*Chas S Thompson, D V S	Do
Phillipsburg		
Plainfield	*Andrew J Krog	Acting health officer
Pleasantville	Robert M Grier, M D	Health inspector
Rahway	*Fred M Williams	Health officer and registrar
Red Bank	W H Lawes, V S	Sanitary inspector
Ridgefield Park	*William F Reynolds, D V M	Health officer
Ridgewood	Harry H Pettit, M D	Do
Roselle	Perry Alexander Proudfoot, M D	Do
Rutherford	*Marine Dunn	Do
South Orange	A C Benedict, M D	Do
South River	Abraham A Pansy, M D	Sanitary inspector
Summit	Henry P Dengler, M D	Health and executive officer
Trenton	*Alton S Fell, M D	Health officer
Union City	Grant P Curtis, M D	Do
West New York	*Rudolph Kunze	Chief inspector
West Orange	*David E Buckley	Health officer and registrar
Westfield	*Andrew Carney	Executive officer
New Mexico		
Albuquerque	*James R Scott, Ph D, M D	County health officer
Roswell	Wm W Phillips, M D	Do
Santa Fe	*E F McIntyre, M D	City and county health officer.
New York		
Albany	*Daniel V O'Leary, M D	Commissioner of health
Amsterdam	P J Fitzgibbons, M D	Health officer
Auburn	John W Copeland, M D	Do
Batavia	Emery F Will, M D	Do
Beacon		
Binghamton	Chalmer J Longstreet, M D	Do
Buffalo	*Francis E Fronczak, LL D, M D, Dr Sc P H	Health commissioner
	*Edward Durney, M D	Deputy health officer
	*Charles A Bentz, M D	Do
Division of child hygiene	*Edward Durney, M D	Director
Communicable disease and division of laboratories	*Charles A Bentz, M D	Do
Division of vital statistics	*G H Westinghouse, M D	Registrar
Division of sanitation	*Frank E Trumble	Assistant chief inspector.
Division of smoke abatement	*Frank E Trumble	Do
Division of food inspection	*Willard B Diebold	Do
Cohoes	Matthew J Keough, M D	Commissioner of health
Corning	Henry E Elwood, Jr, M D	Health officer
Cortland	*Daniel R Reilly, M D, C P H	County commissioner of health.
Dunkirk	G E Ellis, M D	Health officer
Elmira	Reeve B Howland, M D	Do
Endicott	M W Welch, M.D	Do
Floral Park	Arthur E Goldfarb, M D	Do
Freeport	W H Runcie, M D	Do
Fulton	F Edward Fox, M D	Do
Geneva	C W Grove, M.D	Do
Glen Cove	Joseph B Conolly, M D	Do
Glens Falls	*Virgil D Selleck, P H D, M D	Do
Gloversville	Felix L. Johnson, M D	Do
Hempstead	Smith A Combes, M D	Do.
Herkimer	James W Graves, M D	Do
Hornell	George E Taylor, M D	Do
Hudson	*Louis Van Hoesen, M.D	County commissioner of health.

City	Name of health officer	Official title
New York—Continued		
Ithaca	*Lewell T Genung, M D	Health officer and school physician
Jamestown	William M Sill, M D	Superintendent of public health
Johnson City	Rollin O Crosier, M D	Health officer
Johnstown	Guy Vail Wilson, M D	Commissioner of public health and welfare
Kenmore	E R Linklater, M D	Health officer
Kingston	Lester E Sanford, M D	Do
Lackawanna	A S Culkowski, M D	Do
Little Falls	Geo S Eveleth, M D	Do
Lockport	Joseph C Healy, M D	City health officer
Lynbrook		
Mamaroneck	*E M Clark, M D	Health officer
Massena	C E Elkins, M D	Do
Middletown	H J Shelly, M D	Do
Mount Vernon	Frank W Shipman, M D	Commissioner of health
New Rochelle	*Bertrand Francis Drake, M D	Health officer
New York	John L Rice, M D	Commissioner of health
	Herman T Peck, M D	Deputy commissioner of health
Bureau		
General Administration	*Bernard F Plunkett	Secretary
Records	John T Walsh, M D	Acting director
Sanitation	William H Pound, M D	Sanitary superintendent
Preventable diseases	Wm H Best, M D	Acting director
Child hygiene	Isadore Cohen, M D	Do
Nursing	Miss Amelia H Grant	Director
Public health education	Charles F Bolduan, M D	Do
Laboratories	William H Park, M D	Do
Food and drugs	*Thomas F Everett	Acting director
Newburgh	Thomas J Burke, M D	Health officer
Niagara Falls	E E Gillick, M D	Do
North Tonawanda	Henry C Lapp M D	Do
Ogdensburg	Frederick E Clark, M D	Do
Olean	Joseph P Garen, M D	Do
Oneida	D H Conterman, M D	Do
Oneonta		
Ossining	Robert R Bloom, Ch B , M D	Do
Osewego	James E Mansfield, M D	Do
Peekskill	J Douglas Barry, M D	Do
Plattsburg	Leo F Schiff, M D	Do
Port Chester	Wm J Sheehan M D	Do
Port Jervis	G Otto Pobe, M D	Do
Poughkeepsie	*William H Couger, M D	Do
Rensselaer	James C Sharkey, M D	Do
Rochester	*Arthur M Johnson M D	Do
Rockville Center	Arthur D Jaques, M D	Health commissioner
Rome	Lewis N Eames, M D	Health officer
Saratoga Springs	Frederic J Resseguie, M D	Do
Schenectady	Fred J MacDonald	Commissioner of health.
Syracuse	*George C Ruhland, M D	Do
Tonawanda	R H Wilcox, M D	Health officer
Troy	James H Flynn, M D	Commissioner of health
Utica	*Hugh H Shaw, M D	Health officer
Valley Stream	John M Quinn, M D	Do
Watertown	George B Van Doren, M D	Do.
Watervliet	C A Birmingham, M D	Commissioner of health
White Plains	*Edward H Marsh, M D	Deputy commissioner, county department of health
Yonkers	*Clarence W Buckmaster, M D , C P H	Commissioner of health
North Carolina:		
Asheville	*Daniel E Sevier, M D	Health officer
Charlotte	*G L Rea, M D	Do
Concord	*Daniel Greenlee Caldwell, M D	County health officer
Durham	*J H Epperson	Superintendent of health
Elizabeth City	I A Ward, M D	City health officer
Fayetteville	*L L Williams, M D , C.P H	City and county health officer
Gastonia	Mc G Anders, M D	City physician and health officer
Goldsboro	*F M Register, M D	Director of public health
Greensboro	*C C Hudson, M D	City health officer
High Point	W J McAnally, M D	Do
Kinston	*Z V Moseley, M D	County health officer
New Bern	N. M Gibbs, M D	County and city physician
Raleigh	*A. C. Bulla, M D	City and county health officer
Rocky Mount	*Roy Norton, M D	City health superintendent
Salisbury	*Chas. Wallace Armstrong, M.D	City and county health officer.
Shelby	D F Moore, M D	City health officer
Statesville	James M Alexander, M D	Health physician
Thomasville		
Wilmington	*A. H. Elliot, M D	County health officer
Wilson	*W. H. Anderson, M D	City and county health officer.
Winston-Salem	*R. L. Carlton, M D	City health officer
North Dakota:		
Bismarck	Albert M. Fisher, M D	Do.
Fargo	*B. K. Kilbourne, M.D	Do.

City	Name of health officer	Official title
North Dakota—Continued		
Grand Forks	E C Haagensen, M D	City health officer
Minot	J L Devine, M D	Do
Ohio		
Akron	*Melville D Ailes, LL B, M D	Director of health
Alliance	*Floyd R Stamp, D O, M D	Health commissioner and city physician
Ashland	C B Meuser, M D	Director of welfare
Ashtabula	James H Park, M D	Health officer
Barberton	H A Finefrock, M D	Health commissioner
Bellaire	William J Shepard, M D	Do
Bucyrus	W G Carlisle, M D	Do
Cambridge	C L Vorhies, M D	Do
Campbell	Jas S Mariner, M D	Do
Canton	Frank Merrick Sayre, M D	Do
Chillicothe	*R E Bower, Ph B, M D	Do
Cincinnati	*Wm H Peters, M D	Commissioner of health
Cleveland	*Harold J Knapp, M D	Do
Division—		
Communicable diseases	T G Duncan, M D	Director
Child hygiene	R J Ochsner, M D	Do
Laboratories	E B Buchanan	Do
Food and drug administration	R F Leslie, D V M	Do
Public health nurses	Cora M Templeton, R N	Do
Cleveland Heights	*Robert Lockhart, M D	Director of health
Columbus	*N C Dysart, Ph C, M D	Health commissioner
Coshocton	*D M Criswell, M D	Do
Cuyahoga Falls	*R H Markwith, M D	Commissioner of health
Dayton	*A O Peters, M D	Do
East Cleveland	George W Stober, M D	Director of health
East Liverpool	E W Miskall, M D	Health commissioner
Elyria	G E French, M D	Do
Euclid	*Robert Lockhart, M D	District health commissioner
Findlay	*Marthy Laffey, R N	Health commissioner
Fostoria	*L W Gibson	Do
Fremont	E L Vermilya, M D	Do
Garfield Heights	*Robert Lockhart, M D	District health commissioner.
Hamilton	*C J Baldridge, B L, M D	County health commissioner
Ironton	H S Allen, M D	Health commissioner
Lakewood	Wallace J Benner, M D	Commissioner of health.
Lancaster	Clifford B Snider, M D	Health commissioner
Lima	James B Poling, M D	Do
Lorain	Valloyd Adair, M D	Do
Mansfield	*J H Hayes, M D	Do
Marietta	J B McClure, M D	Do
Marion	Kenneth D Smith, M D	Do
Martins Ferry	*John Donovan	Do
Massillon	*John H Williams	Do
Middletown	*George D Lummis, M D	Do
New Philadelphia	*Joseph Blickensderfer, M D	Do
Newark	W H Knauss, M D	Do
Niles	W A Werner, M D	Do
Norwood	L O Saur, M D	Do
Painesville	*Clara Carter Wilder, R N	Commissioner of health
Parma	*Robert Lockhart, M D	Health commissioner
Piqua	L G Whitney	Do
Portsmouth	O D Tatjo, M D	Do
Salem	R T Holzbach, M D	Do
Sandusky	*F M Houghtaling, M D	Do
Shaker Heights	Paul Marcus Spurney, M D	Director of health
Springfield	*Oscar Millson Craven, M D	Director of public health
Steubenville	*Julius A Pizzoferrato	City health commissioner.
Struthers	Charles Scofield, M D	Health commissioner
Tiffin	J A Gosling, M D	Do
Toledo	*Walter S Holley, M D	Commissioner of health
Warren	M T Knappenberger, M D	Health commissioner
Wooster	*Wm G Rhoten, M D	Do
Xenia	A D De Haven, M D	Do
Youngstown	C H Beight, M D	Commissioner of health.
Zanesville	Edmund R Brush, M D	Health commissioner.
Oklahoma		
Ada	M M Webster, M D	City health officer
Ardmore	A Y Easterwood, M D	City physician
Bartlesville	Elizabeth Chamberlin, M D	City superintendent of health.
Chickasha	E L Dawson, M D	Do
Enid	R C Baker, M D	Do.
Lawton	Fratis Duff	City chemist
McAlester	*Chas M Pearce, M D	Superintendent of health
Muskogee	L S McAlester, M D	City physician
Oklahoma City	*Walter H Miles, M D	Director of health
Okmulgee		
Ponca City		
Sapulpa	*A C Frampton	Dairy and health inspector.
Seminole		
Shawnee	H G Campbell, M D	City physician

City	Name of health officer	Official title
Oklahoma—Continued		
Tulsa	J Jeff Billington, M D	Superintendent of health
Wewoka	Geo Hunter, M D	Health officer
Oregon		
Astoria	Nellie S Vernon, M D	City and county health officer
Eugene	*Ronald C Romig, M D	County health officer
Klamath Falls	A A Soule, M D	Health officer and city physician.
Medford	L D Inskeep, M D	City health officer
Portland	*John G Abele, M D	Do
Salem	*Vernon A Douglas, M D	City and county health officer
Pennsylvania		
Aliquippa	*James E Tanner	Health officer
Allentown	*J Treichler Butz, D D S, M D	Do
Altoona	*T G Herbert	Superintendent, bureau of health.
Ambridge	*Louis Herrmann	Health officer
Arnold	A B Bishop	Do
Beaver Falls	*Nelson W Osmond	Health officer and plumbing inspector
Bellevue	*James B Arthur	Health officer
Berwick	*Charles Ross	Do
Bethlehem	F J Conahan, M D	City physician
Braddock	*James E Wills	Health officer
Bradford	*R G Vogel	Do
Bristol	John M Wright	Do
Butler	*J Fred Leetch	Do
Canonsburg	*Frank Milligan	Do
Carbondale	*Paul Nelson	Sanitary officer
Carlisle	*U Grant-Eppley	Health officer
Carnegie	Jos Lewis	Do
Chambersburg	*Frank J Croft	City health officer
Charleroi	*J M Hill	City health officer and inspector
Chester	*Timothy McCarey	Health officer
Clairton	*F F Keller	Do
Coatesville		
Columbia	George M Rodenhauser	Do
Connellsville	*D E Minerd	Health officer and sealer of weights and measures
Conshohocken	Thomas S White	Health officer and secretary
Coraopolis	F H Stark	Health officer.
Dickson City		
Donora	*Herman Lang	Do
Dormont	Henry Chrystal	Do
Du Bois	J I Brockbank, M D	Do
Dunmore	*William Ferrese	Do
Duquesne	*C W Goldstrohm	Do
Easton	Joseph Samuel Cohen, M D	City health officer.
Ellwood City	*Lewis Young	Do
Erie	*J R Smith, M D	Health officer
Farrell	*Katherine M Daly	Do
Franklin		
Greensburg	*T Ray Hunter	Do
Hanover	*F Y Stambaugh	Do
Harrisburg	John M J Raunick, M D	Do.
Hazleton	*William Pfaff	Do
Homestead	*M D Weis	Do.
Jeanette	*Chas E Walter	Chief health officer.
Johnstown	L W Jones, M D	Health officer.
Kingston	*J F Seward	Do
Lancaster	*Benj F Charles	Do
Latrobe	W T Osborne	Do
Lebanon	John D Bogen, M D	Do.
Lewistown	H E. Fetterolf	Do
McKeesport	*Daniel F Marsh	Do
McKees Rocks		
Mahanoy City	*Harry Martin	Do
Meadville	*John L Laley	Do
Monessen	*Francis E Gibson	City health officer
Mount Carmel	*Charles F Cohoon	Health officer
Munhall	Charles Watts	Do
Nanticoke	*H J Abbott	Do
New Castle	William L Steen, M D	Do
New Kensington	*John H Evans	Ordinance and health officer.
Norristown	*R Ronald Dettre	Health officer
North Braddock	*George A Shephard	Do
Oil City	*William J. Lewis	Do
Old Forge		
Olyphant		

City	Name of health officer	Official title
Pennsylvania—Continued		
Philadelphia		
Department of public health	*J Norman Henry, M D	Director, department of public health
	*George A Knowles, M D	Assistant director, department of public health
Bureau of health	*William J Wolf	Secretary
Bureau of hospitals		
Philadelphia General Hospital, 34th and Pine Streets	*William G Turnbull, M D	Superintendent
Philadelphia Hospital for Contagious Diseases, 2nd and Luzerne Streets	*Pascal F Lucchesi, M D	Acting superintendent
Philadelphia Hospital for Mental Diseases, Byberry	*James P Sands, M D	Superintendent
Phoenixville	*Russell E Deery	Health officer
Pittsburgh	*W W McFarland, M D	Director, department of public health
Bureau of infectious diseases (including municipal and tuberculosis hospitals)	*P E Marks, M D	Superintendent
Bureau of sanitation	*Charles Parkinson	Do
Bureau of child welfare	*H J Benz, M D	Do
Bureau of food inspection	*J C McNeil, V M D	Do
Bureau of smoke regulation	*H B Meller, C E	Do
Pittston	*Michael A McHale	Health officer
Plymouth	*H G Templeton, M D	Secretary, board of health.
Pottstown	*A John André	Health officer
Pottsville	*A C Huntzinger	Do
Reading	*Ira J Hain, M D	Do
Scranton		
Shamokin		
Sharon	*J S Hildebrand	Sanitary officer
Shenandoah	*Joseph McLuskey	Health officer
Steelton	*E G Butler	Do
Sunbury	*Victor A Koble	Do
Swissvale	*William H Rushworth	Do
Tamaqua	Lamont Perrine	Constable
Taylor	E E Edwards, M D	Health officer.
Turtle Creek	*Manuel Emmanuel	Do
Uniontown	W C Hall	City health officer
Vandergrift	J D Remaley	Health officer
Warren	*R N Brown	Do
Washington	*Thomas W Henderson	Secretary, board of health.
Waynesboro	*Percy H Snowberger	Health officer
West Chester	William A Limberger, M D	Secretary, board of health
Wilkes-Barre	*Charles B Crittenden, M D	Principal health officer
Wilkinsburg	*J M Snyder	Health officer
Williamsport	*William J Mollenkopf	Do
York	*J Frank Small, M D	Director of public health
Rhode Island		
Bristol	Daniel E Dwyer	Health officer
Central Falls	Charles S Doucet, M D	Health superintendent
Cranston	Daniel S Latham, M D	Superintendent of health
East Providence	W H T Hamill, M D	Health officer.
Newport		
North Providence		
Pawtucket	Albert L Vandale, M D	Superintendent of health.
Providence	*Dennett L Richardson, M D	Do
Warwick	*Lawrence Jackson Smith, M D	Do
West Warwick		
Westerly	Samuel C Webster, Ph G, M D	Do
Woonsocket	Thomas S Flynn, M D	Health officer
South Carolina		
Anderson	*E E Epting, M D	City and county health officer.
Charleston	*Leon Banov, M D	City-county health officer
Columbia	Paul Eugene Payne, M D	Health officer.
Florence	*George Dawson Heath, M D Dr P H	Health commissioner
Greenville	*Irving Sydnor Bardsdale, M D	Commissioner of health.
Greenwood	*Joseph E Brodie, M D	County health officer
Rock Hill	R D Sumner, M D	Medical officer
Spartanburg		
Sumter	*S R. Kitchen, D V M	City health officer
South Dakota.		
Aberdeen	J F Adams, M D	Do
Huron	William H Saxton, M.D	City physician
Mitchell	E M Young, M D	City health officer
Rapid City	*F S Austin, M D	County health officer.
Sioux Falls	W. E. Donahoe, M D	Health officer.
Watertown	W. G Magee, M D	City health officer.

City	Name of health officer	Official title
Tennessee		
Bristol	*F L Moore, M D	Director, county health department
Chattanooga	*Fred C McIsaac, M D	Director of health
Jackson	Herman Hawkins, M D	City physician
Johnson City	*W L Poole, M D, M P H	Director, health department
Kingsport	H W Longworth, M D	City physician
Knoxville	*William H Enneis, M D, M P H	Health officer
Memphis	*L M Graves, M D	Superintendent, health department
Nashville	*John Overton, M D	City health officer
Texas		
Abilene	Scott W Hollis, M D	Health officer
Amarillo	*B M Primer, M D, M P H	Director, county health unit
Austin	Eugene O Chimene, M D	Director, city-county health unit
Beaumont	Fred Colby, M D	City health officer
Big Spring	M H Bennett, M D	Do
Brownsville	Thurman A Kinder, jr, M D	Do
Brownwood	H L Locker, Ph G, M D	Do.
Cleburne	Joseph M Stallcup, M D	Do
Corpus Christi	N D Carter, M D	Do
Corsicana	W D Cross, M D	Do
Dallas	*J W Bass, M D	Director of public health
Del Rio	W R McWilliams, M D	City health officer
Denison	W A Lee, M D	Do
El Paso	*T J McCamant, M D	Director, city-county health unit
Fort Worth	*A H Flickwir, M D	Director, public health and welfare.
Galveston	Walter Kleberg, M D	City health officer
Greenville	B F Arnold, M D	Do
Harlingen	V M Bass, M D	Do
Houston	*George Washington Larendon, M D	Director of public health
Laredo	H M Austin	City health officer
Lubbock	J W Rollo	Do
Marshall	Galen Eads	Do
Palestine	J M Colley, M D	Do
Pampa	Archie Cole, M D	Do
Paris	John A Stephens, M D	Do
Port Arthur	F J Beyt, M D	Do
San Angelo	B T Brown, M D	Do
San Antonio	*W A King, M D	Do
San Benito	Neal D Monger, M D	Do
Sherman	J H Carraway, M D	Do
Sweetwater	*Ernest W Prothro, M D	Director of public health
Temple	Robert R Curtis, M D	City health officer
Texarkana	Joe Ellis Tyson, M D	Do
Tyler	Albert Woldert, Ph G, M D	Do
Waco	R W Crosthwait, M D	Health officer
Wichita Falls	*Robert B Wolford, M D	City health officer
Utah		
Ogden	N H Savage, M D	City physician
Provo		
Salt Lake City	L E Viko, M D	Health commissioner
Vermont		
Barre	Michael F Cerasoli, M D	Health officer
Bennington	*Joseph M Ayres	Do
Burlington	Erald F Foster, M D	City health officer
Rutland	*Clare M Cole	Health officer
Virginia:		
Alexandria	*W Lewis Schaefer, M D	Health officer and clinician.
Charlottesville	*E L McQuade, M D, Dr P H	Health officer
Danville	*R W Garnett, M D	Do
Hopewell	L A Sims	City engineer
Lynchburg	*Mosby G Perrow, Ph D	Director of public welfare
Newport News	*G Colbert Tyler, M D	Health officer
Norfolk	*Powhatan S Schenck, M D	Health commissioner
Petersburg	Mason Romaine, M D	Health officer
Portsmouth	*Lonsdale J Roper, M D	Director of public welfare.
Richmond	*W Brownley Foster, M D	Do
Roanoke	*Coleman Bernard Ransone, M D	Health officer
Staunton	F M Carroll, M D	Do
Suffolk	*Challis Haddon Dawson, M D	Director of Health
Winchester	L. M Allen, M D	Health officer
Washington.		
Aberdeen	B. O Swinehart, M D	City health officer.
Bellingham	Isaac W Powell, M D	Do.
Bremerton	David H. Polk, M D	Do
Everett	I W Parsons, M D	Health officer
Hoquiam	John W Stevenson, M D	City health officer.
Longview	J S McCarthy, M D	Do
Olympia	W. L. Bridgford, M D	Do
Port Angeles	Wm. H. Taylor, M D	Do
Seattle	*F. M. Carroll, M D	Commissioner of health.
Spokane	*Ralph Hendricks, M.D	Health officer
Tacoma	Samuel Morton Creswell, M D	Director of health.
Vancouver	*George H.T. Sparling, M D	Do.
Walla Walla	*J. B. Vanderpool, M.D	City-county health officer.

City	Name of health officer	Official title
Washington—Continued		
Wenatchee	*C R Fargher, M D	Health officer and county physician.
Yakima	*Lloyd Moffitt, M D	City health officer
West Virginia		
Bluefield	*David B Lepper, M D, C P H	City health director
Charleston	*Hugh B Robins, M D	Health commissioner
Clarksburg		
Fairmont	*J H Jamison, M D	City health officer
Huntington	*W M York, M D	Health commissioner
Martinsburg	*Edwin Cameron, M D	Health officer
Morgantown	*R C Farrier, M D	County health officer
Moundsville	*Wm G C Hill, Ph G, M D	County health director
Parkersburg	*Arthur D Knott, M D, D P H	City and county health officer.
Wheeling	*Reece M Pedicord, M D	City health commissioner
Wisconsin		
Appleton	Frank P Dohearty, M D	Health officer
Ashland	*Henry Wolfman	Do
Beloit	H O Delaney, M D	Do
Cudahy	Bernard Krueger, M D	Do
Eau Claire	L H Flynn, M D	Do
Fond du Lac	*Ewald H Pawsat, M D	Do
Green Bay	Henry S Atkinson, M D	Health commissioner
Janesville	Fred B Welch, M D	Health officer
Kenosha	*G Windesheim M D	Director of health
La Crosse	*Anthony M Murphy	Health officer and acting commissioner
Madison	*F F Bowman, B L, M D	Health officer
Manitowoc	George M Hoffman, M D	Commissioner of health
Marinette	J Wm Boren, M D	Health commissioner
Milwaukee	*John P Koehler, M D	Commissioner of health
	E V Brumbaugh, M D	Deputy commissioner of health.
School hygiene division	*George P Barth, M D	Director
Division of venereal diseases	*William J McKillip, M D	Do
Vital statistics	*George E Adams	Deputy registrar
Division of tuberculosis	*George R Ernst, M D	Director
Contagious disease division	*Robert E Hickey, M D	Do
Division of food and sanitary inspection	*Stanley Pilgrim, M D C	Do.
Bureau of laboratories	*R W Cunliffe	Do
Division of child welfare	*E V Brumbaugh, M D	Do
Division of nurses	*Alma Brunk, R N	Do
Oshkosh	*J J Kronzer, M D	City physician and health commissioner
Racine	*I F Thompson, M D, M P H	Commissioner of health
Sheboygan	*Gustav J Hildebrand, M D	Commissioner of public health.
Shorewood	Roy W Benton, M D	Health commissioner
South Milwaukee	Joseph Grimm, M D	Do
Stevens Point	Ferdinand R Krembs, M D	Health officer
Superior	*P G McGill, M D	Health commissioner
Two Rivers	Alfred P Zlatnik, M D	Commissioner of health
Watertown	F C Haney, M D	Health commissioner
Waukesha	F M Scheele, M D	Do
Wausau	*L F Bugbee	Health officer
Wauwatosa	E F Peterson, Ph G, M D	Health commissioner
West Allis	*Charles S Stern, M.D	Commissioner of health
Wyoming		
Casper	J C Kamp, M D	County health officer
Cheyenne	G M Anderson, M D	Do

COURT DECISION RELATING TO PUBLIC HEALTH

Refusal of permit and license for live poultry market upheld.—(New Jersey Supreme Court; *Roich* v. *Board of Commissioners of Union City et al.*, 168 A. 165; decided Aug 29, 1933.) The relator sought a writ of mandamus to compel the issuance of a permit and license to operate a live poultry market in Union City. By ordinance the health officer was vested with discretion in granting a permit and, without such permit, no license could be granted. No licenses, except renewals, had been granted since the adoption some years before of commission government, as live poultry markets were not favorably regarded by the health officer because of the stench and vermin

incident thereto In upholding the refusal of a permit and license the supreme court said

It seems that the board of commissioners may very well refuse to issue new permits for what they believe to be an unnecessary and an unsanitary business. Because there are some poultry markets which have been conducted for a long time is no reason for the allowance of others, even though the effect of the action may be that fewer persons may engage in the business

As before indicated, the granting of the permit and license rests in the sound discretion of the health officer and the board of commissioners, and there is nothing in the record to indicate that they have abused that discretion

DEATHS DURING WEEK ENDED JAN. 13, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Jan 13, 1934	Corresponding week 1933
Data from 86 large cities of the United States		
Total deaths	9,169	9,690
Deaths per 1,000 population, annual basis	12 8	13 5
Deaths under 1 year of age	616	710
Deaths under 1 year of age per 1,000 estimated live births	57	[1] 61
Deaths per 1,000 population, annual basis, first 2 weeks of year	12 9	13 6
Data from industrial insurance companies		
Policies in force	67,359,046	69,167,602
Number of death claims	15,805	17,306
Death claims per 1,000 policies in force, annual rate	12 2	13 0
Death claims per 1,000 policies, first 2 weeks of year, annual rate	10 0	10 8

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Jan. 20, 1934, and Jan. 21, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan 20, 1934, and Jan 21, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan 20, 1934	Week ended Jan 21, 1933	Week ended Jan 20, 1934	Week ended Jan 21, 1933	Week ended Jan 20, 1934	Week ended Jan 21, 1933	Week ended Jan 20, 1934	Week ended Jan 21, 1933
New England States								
Maine			2	994	8	1	1	0
New Hampshire	1	1			70	1	0	0
Vermont	1	2			25	3	0	0
Massachusetts	15	38		293	1,441	125	3	2
Rhode Island	1	5		53	4	1	0	0
Connecticut	5	1	12	249	17	109	0	0
Middle Atlantic States								
New York	58	67	[1] 22	[1] 312	561	1,106	3	8
New Jersey	14	24	29	474	218	257	1	2
Pennsylvania	79	134			1,420	422	4	11
East North Central States								
Ohio	56	49	8	195	122	544	1	2
Indiana	45	51	60	220	293	16	1	5
Illinois	35	65	43	159	219	169	6	16
Michigan	18	22	4	78	36	372	1	1
Wisconsin	2	4	48	2,887	229	227	2	1
West North Central States.								
Minnesota	21	3		102	79	424	0	3
Iowa [2]	14	13	12	69	28		1	5
Missouri	59	32	15	87	614	86	0	5
North Dakota	5	7	4	2,517	242	109	1	0
South Dakota	2	1		57	294	4	0	0
Nebraska	13	15	12	11	49	20	0	1
Kansas	11	6	3	812	39	55	2	1
South Atlantic States								
Delaware	6	2		49	91	2	0	0
Maryland [2]	9	16	32	928	57	5	0	1
District of Columbia	20	13	3	8	137	2	0	0
Virginia	43	11			499	178	4	5
West Virginia	40	20	68	664	34	225	2	0
North Carolina	27	17	60	1,301	1,541	291	3	4
South Carolina	14	7	683	3,681	329	38	0	0
Georgia [3]	11	17	79	877	667	4	0	0
Florida	10	10	1	76	8		0	0
East South Central States:								
Kentucky	12	14	4	1,042	17		0	1
Tennessee	20	25	103	726	587	2	2	4
Alabama [3]	33	18	105	751	241	2	2	1
Mississippi [2]	20	7					1	2

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan. 20, 1934, and Jan. 21, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933
West South Central States								
Arkansas	7	17	43	347	313	18	0	2
Louisiana	32	20	7	260	25	7	1	1
Oklahoma [4]	36	16	111	1,077	339	1	3	7
Texas [3]	103	94	292	706	906	230	2	5
Mountain States								
Montana	------	7	2	1,754	7	214	0	0
Idaho	3	6	------	6	51	14	0	0
Wyoming	------	------	------	------	16	------	0	0
Colorado	7	5	------	108	24	3	0	0
New Mexico	12	11	7	8	95	2	1	1
Arizona	4	3	10	18	9	------	2	0
Utah	1	2	------	1	768	5	0	0
Pacific States								
Washington	2	10	------	12	355	3	0	2
Oregon	10	2	27	279	33	20	1	1
California	52	57	32	515	339	182	3	1
Total	1,049	967	1,943	24,763	13,496	5,499	54	101

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933	Week ended Jan. 20, 1934	Week ended Jan. 21, 1933
New England States								
Maine	0	0	5	37	0	0	1	0
New Hampshire	0	0	11	29	0	0	0	0
Vermont	0	0	16	29	0	0	1	0
Massachusetts	0	0	203	384	0	0	2	0
Rhode Island	0	0	28	40	0	0	0	0
Connecticut	0	0	71	108	0	0	0	1
Middle Atlantic States								
New York	0	0	583	758	0	0	8	9
New Jersey	0	0	194	273	0	0	5	2
Pennsylvania	3	0	696	958	0	0	10	5
East North Central States:								
Ohio	1	0	422	413	2	8	6	2
Indiana	1	0	200	110	3	2	3	2
Illinois	1	2	500	471	5	9	8	6
Michigan	1	0	421	421	0	0	3	5
Wisconsin	0	0	175	156	54	4	0	1
West North Central States								
Minnesota	1	0	93	73	4	0	2	0
Iowa [2]	0	0	80	43	8	23	0	2
Missouri	0	0	167	109	5	0	7	1
North Dakota	0	0	17	26	0	0	0	0
South Dakota	0	0	18	17	1	0	0	35
Nebraska	0	1	20	35	8	3	1	0
Kansas	0	0	133	85	0	1	0	2
South Atlantic States								
Delaware	0	0	17	11	0	0	0	0
Maryland [3]	0	0	83	113	0	0	1	0
District of Columbia	0	0	18	22	0	0	0	0
Virginia	1	0	97	57	0	0	5	5
West Virginia	1	0	128	27	0	0	3	5
North Carolina	1	1	78	61	0	0	5	6
South Carolina	0	0	6	9	0	0	4	0
Georgia [3]	0	0	15	14	0	1	4	5
Florida	0	0	5	17	0	0	5	1
East South Central States:								
Kentucky	3	1	61	45	0	1	2	5
Tennessee	1	0	62	81	1	0	9	8
Alabama [3]	1	2	29	12	2	0	5	3
Mississippi [3]	0	1	19	14	1	2	2	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan 20, 1934, and Jan 21, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan 20, 1934	Week ended Jan 21, 1933	Week ended Jan 20, 1934	Week ended Jan 21, 1933	Week ended Jan 20, 1934	Week ended Jan 21, 1933	Week ended Jan 20, 1934	Week ended Jan 21, 1933
West South Central States								
Arkansas	0	0	5	13	3	13	8	2
Louisiana	0	0	30	10	1	1	20	5
Oklahoma [4]	0	0	22	29	5	1	3	0
Texas [3]	0	0	122	82	12	14	15	11
Mountain States								
Montana	0	0	18	16	0	1	2	0
Idaho	0	0	14	5	1	0	1	0
Wyoming	0	0	2	2	7	0	0	0
Colorado	0	0	27	27	0	0	2	0
New Mexico	0	1	52	20	1	0	3	7
Arizona	1	2	17	14	0	0	1	0
Utah [2]	0	0	8	14	7	0	1	0
Pacific States								
Washington	5	0	46	37	0	6	4	0
Oregon	0	1	46	16	3	12	8	2
California	4	2	331	203	24	48	6	1
Total	26	14	5,420	5,496	158	150	174	141

[1] New York City only

[2] Week ended earlier than Saturday

[3] Typhus fever, week ended Jan 20, 1934, 16 cases, as follows Georgia, 7, Alabama, 3, Texas, 6

[4] Exclusive of Oklahoma City and Tulsa

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December 1933										
Alabama[1]	1	181	258	218	337	32	3	167	4	32
Arizona		31	112		38		5	109	0	13
Idaho		1	3		72		2	43	5	10
Illinois	43	227	78	7	182	2	6	1,754	3	55
Iowa	4	56	10		143		2	350	20	16
Louisiana		127	47	167	18	5	5	102	34	47
Maryland	2	85	116	4	70	1	2	333	0	29
Michigan	8	85	24	2	143		2	1,390	7	50
Minnesota	4	43	3		178		4	262	20	15
North Carolina	8	271	71		2,425	12	1	502	2	18
Pennsylvania	12	262		1	1,308		12	1,998	0	71
Rhode Island	2	17			20		0	59	0	5
South Carolina		223	2,253	596	569	92	5	70	2	31
South Dakota		75	9		1,276		0	106	2	0
West Virginia	12	202	272		64		4	566	6	29

December 1933

	Cases
Actinomycosis	
Illinois	1
Chicken pox	
Alabama	260
Arizona	57
Idaho	36
Illinois	2,119
Iowa	347
Louisiana	51
Maryland	593
Michigan	1,792
Minnesota	1,123
North Carolina	516
Pennsylvania	3,936

December 1933—Continued

	Cases
Chicken pox—Continued	
Rhode Island	81
South Carolina	110
South Dakota	223
West Virginia	359
Conjunctivitis	
Arizona	4
Maryland	1
Dengue	
Alabama	1
South Carolina	7
Diarrhea Maryland	9
Dysentery:	
Alabama (amoebic)	7

December 1933—Continued

	Cases
Dysentery—Continued	
Arizona	3
Illinois (amoebic)	94
Illinois (amoebic, carriers)	365
Illinois (bacillary)	6
Iowa	4
Louisiana	3
Maryland	13
Michigan	20
Michigan (carrier)	1
Minnesota (amoebic)	19
Minnesota (bacillary)	2
Pennsylvania	17

December 1933—Continued

	Cases
Dysentery—Continued	
West Virginia (amoebic)	1
Favus	
Minnesota	1
German measles	
Arizona	2
Illinois	23
Maryland	8
Michigan	46
North Carolina	11
Pennsylvania	61
Rhode Island	1
Hookworm disease	
Louisiana	20
Maryland	1
Impetigo contagiosa	
Arizona	14
Illinois	8
Iowa	1
Maryland	41
Lead poisoning	
Illinois	4
Maryland	1
Leprosy	
Louisiana	1
Lethargic encephalitis	
Alabama	6
Illinois	9
Iowa	4
Maryland	1
Michigan	8
Minnesota	3
Pennsylvania	1
Rhode Island	1
South Carolina	8
Mumps	
Alabama	14
Arizona	5
Idaho	6
Illinois	526
Iowa	100
Louisiana	3
Maryland	76
Michigan	371
Pennsylvania	1,023
Rhode Island	7
South Carolina	112
South Dakota	21
West Virginia	2
Ophthalmia neonatorum	
Illinois	6

December 1933—Continued

	Cases
Ophthalmia neonatorum—Continued	
Maryland	1
North Carolina	2
Pennsylvania	9
Rhode Island	2
Paratyphoid fever	
Illinois	4
Louisiana	1
South Carolina	1
Puerperal septicemia	
Illinois	5
Pennsylvania	5
Rabies in animals	
Illinois	13
Louisiana	32
Maryland	2
South Carolina	9
Rabies in man	
Illinois	1
West Virginia	1
Rocky Mountain spotted fever	
Pennsylvania	1
Scabies	
Maryland	2
Septic sore throat	
Arizona	1
Illinois	17
Iowa	2
Maryland	11
Michigan	70
North Carolina	13
Rhode Island	1
South Dakota	3
Tetanus	
Alabama	5
Illinois	5
Louisiana	5
Maryland	1
Trachoma	
Arizona	46
Illinois	10
Minnesota	3
Pennsylvania	2
Trichinosis	
Michigan	1
Tularaemia	
Alabama	1
Illinois	93
Iowa	7

December 1933—Continued

	Cases
Tularaemia—Continued	
Louisiana	1
Maryland	17
Michigan	5
Minnesota	6
North Carolina	2
Pennsylvania	5
South Carolina	3
West Virginia	1
Typhus fever	
Alabama	59
Louisiana	2
Maryland	1
North Carolina	13
South Carolina	4
Undulant fever	
Alabama	4
Arizona	1
Illinois	12
Iowa	5
Louisiana	3
Maryland	6
Michigan	5
Minnesota	6
North Carolina	1
Pennsylvania	8
Rhode Island	[1] 2
South Carolina	3
South Dakota	1
Vincent's infection	
Illinois	66
Iowa	1
Maryland	13
Michigan	15
Whooping cough	
Alabama	137
Arizona	47
Idaho	2
Illinois	824
Iowa	71
Louisiana	44
Maryland	295
Michigan	716
Minnesota	226
North Carolina	710
Pennsylvania	1,505
Rhode Island	75
South Carolina	237
South Dakota	37
West Virginia	237

[1] Delayed report

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan. 13, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine:											
Portland	0	------	0	1	4	1	0	0	1	11	42
New Hampshire:											
Concord	0	------	0	0	1	1	0	0	0	0	9
Manchester	0	------	0	3	3	4	0	0	0	0	15
Nashua	0	------	0	1	0	9	0	0	0	0	--------
Vermont:											
Barre	1	------	0	6	0	0	0	0	0	0	2
Burlington	2	------	0	1	0	3	0	0	0	7	7
Massachusetts:											
Boston	2	------	0	245	29	67	0	10	1	67	260
Fall River	1	------	0	0	3	5	0	1	0	4	36
Springfield	0	------	0	4	1	4	0	1	0	9	30
Worcester	0	------	0	203	11	9	0	3	0	21	64
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	19
Providence	1	------	0	1	11	13	0	0	0	19	81

City reports for week ended Jan 13, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Connecticut											
Bridgeport	0	3	2	4	3	5	0	1	0	1	45
Hartford	1	------	0	0	2	8	0	2	0	2	53
New Haven	0	------	0	0	8	3	0	3	0	2	61
New York											
Buffalo	3	1	4	156	12	31	0	6	0	27	143
New York	36	16	13	29	183	254	0	94	3	144	1,676
Rochester	0	------	0	1	4	22	0	0	0	5	84
Syracuse	0	------	0	0	11	8	0	2	0	45	52
New Jersey											
Camden	1	1	0	9	7	10	0	0	0	1	41
Newark	1	6	0	5	10	19	0	8	0	26	96
Trenton	0	2	0	1	5	11	0	2	0	6	53
Pennsylvania											
Philadelphia	6	11	4	498	55	83	0	23	1	71	502
Pittsburgh	7	3	3	12	33	32	0	6	0	62	163
Reading	0	------	0	7	4	5	0	1	0	7	28
Scranton	0	------	0	0	0	5	0	0	0	6	--------
Ohio											
Cincinnati	15	------	3	243	15	24	0	10	0	14	142
Cleveland	7	38	2	2	30	81	0	17	1	69	232
Columbus	5	1	1	1	8	23	0	1	0	10	95
Toledo	2	4	3	53	8	19	0	5	1	22	89
Indiana											
Fort Wayne	10	------	0	0	4	7	0	2	0	1	25
Indianapolis	2	------	1	10	19	12	0	6	1	24	--------
South Bend	0	------	1	0	3	10	0	0	0	0	20
Terre Haute	1	------	0	36	3	2	0	0	0	0	11
Illinois											
Chicago	2	6	6	18	75	242	0	43	4	127	772
Cicero	0	------	0	0	1	0	0	0	0	0	5
Springfield	1	------	0	0	3	4	0	0	0	1	33
Michigan											
Detroit	5	4	1	9	35	97	0	13	0	63	275
Flint	0	------	0	2	10	36	0	0	0	19	34
Grand Rapids	0	------	5	0	8	16	0	3	0	1	56
Wisconsin											
Kenosha	0	------	0	0	0	28	0	0	0	2	11
Madison	0	------	--------	5	-------	5	0	-------	0	26	20
Milwaukee	1	1	1	0	10	42	0	7	0	62	107
Racine	0	------	0	0	0	9	0	0	0	5	9
Superior	0	------	0	0	0	1	0	1	0	2	7
Minnesota											
Duluth	0	------	0	1	4	1	0	0	0	1	22
Minneapolis	5	------	1	0	17	16	0	1	0	43	119
St Paul	0	------	0	2	15	19	0	3	1	11	69
Iowa											
Des Moines	2	------	--------	0	-------	6	0	-------	0	1	28
Sioux City	1	------	--------	0	-------	1	0	-------	0	0	--------
Waterloo	0	------	--------	0	-------	0	0	-------	0	3	--------
Missouri											
Kansas City	6	------	0	2	22	25	0	2	0	16	105
St Joseph	0	------	0	1	5	7	0	0	0	0	8
St Louis	25	2	1	322	23	25	0	5	1	40	195
North Dakota											
Fargo	0	------	0	134	0	0	0	0	0	9	5
Grand Forks	0	------	0	0	0	0	0	0	0	1	--------
South Dakota											
Aberdeen	0	------	0	1	0	0	0	0	0	0	--------
Nebraska											
Omaha	2	------	0	12	3	8	2	3	0	12	60
Kansas											
Topeka	0	------	1	1	2	4	0	1	0	1	18
Wichita	0	------	0	4	2	11	0	4	0	6	24
Delaware											
Wilmington	2	------	0	3	1	2	0	0	1	7	35
Maryland											
Baltimore	2	9	2	15	34	59	0	16	0	114	230
Cumberland	2	------	0	0	0	2	0	1	0	0	10
Frederick	0	------	0	0	0	2	0	0	0	0	4
District of Columbia											
Washington	13	5	2	101	22	16	0	12	7	18	202
Virginia											
Lynchburg	0	------	0	0	3	1	0	0	1	0	10
Norfolk	1	1	0	7	0	2	0	0	0	0	89
Richmond	1	------	0	1	5	10	0	3	0	0	42
Roanoke	3	------	0	1	4	2	0	0	0	0	34

City reports for week ended Jan. 13, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
West Virginia											
Charleston	0	1	0	0	2	3	0	1	0	0	20
Huntington	3		0	0	0	11	0	0	0	0	
Wheeling	0		0	0	3	4	0	0	0	24	12
North Carolina											
Raleigh	0		0	1	3	6	0	2	0	18	16
Wilmington	1		0	0	3	0	0	0	0	2	8
Winston-Salem	2		0	229	1	4	0	0	0	0	13
South Carolina											
Charleston	0	33	1	3	2	0	0	2	3	1	30
Columbia	0		0	0	0	0	0	0	0	0	6
Greenville	1		0	0	1	0	0	0	2	1	8
Georgia											
Atlanta	5	29	0	64	13	6	0	5	0	2	77
Brunswick	0		0	13	0	0	0	0	0	0	4
Savannah	1	4	2	12	2	0	0	2	0	0	40
Florida											
Miami	1		0	0	1	1	0	3	0	14	42
Tampa	3		0	1	2	1	0	2	0	0	31
Kentucky											
Ashland	0			0		0	0		0	0	
Lexington	1		0	1	3	0	0	3	0	5	17
Louisville	6	1	0	1	8	18	0	2	0	1	97
Tennessee											
Memphis	3		1	48	8	7	0	4	0	3	77
Nashville	0		0	58	0	14	0	4	1	9	46
Alabama											
Birmingham	8	13	3	1	7	3	0	2	0	3	83
Mobile	1	1	0	3	3	1	0	1	0	2	16
Montgomery	1	1		1		1	0		0	15	
Arkansas											
Fort Smith	0			42		0	0		0	0	
Little Rock	0		0	45	3	0	0	0	0	0	3
Louisiana											
New Orleans	14	2	0	4	11	18	0	12	5	0	133
Shreveport	1		0	1	0	2	0	4	0	0	34
Texas											
Dallas	10		0	1	15	8	0	5	1	1	70
Fort Worth	7		2	0	11	8	1	1	0	1	49
Galveston	1		0	0	2	1	0	2	1	0	16
Houston	8		1	1	9	1	1	5	0	0	70
San Antonio											
Montana											
Billings	0		0	0	0	0	0	0	0	0	9
Great Falls	0		0	1	2	0	0	0	0	2	11
Helena	0		0	0	0	0	0	0	0	0	3
Missoula	0		0	0	0	1	0	0	0	0	1
Idaho											
Boise	0		0	0	1	0	0	1	[1] 1	3	5
Colorado											
Denver	0	29	2	1	12	12	3	6	1	63	105
Pueblo	0		0	0	2	2	0	0	0	4	12
New Mexico											
Albuquerque	2		0	1	1	2	0	2	0	2	11
Utah											
Salt Lake City	1		0	554	3	6	0	0	0	23	32
Nevada											
Reno	0		0	0	0	0	0	0	0	0	2
Washington											
Seattle	0			5	11	18	0	6	0	59	89
Spokane	0			316	1	1	0	1	0	0	22
Tacoma	1		0	0	2	2	0	1	0	14	28
Oregon											
Portland	0	1	0	3	3	22	1	4	0	19	69
Salem	1	5	0	0	0	0	0	0	0	2	
California											
Los Angeles	17	26	2	8	20	101	3	20	1	48	338
Sacramento	1	2	0	2	3	0	0	5	0	0	33
San Francisco	4	8	2	5	22	12	0	9	2	29	190

[1] Imported.

City reports for week ended Jan 13, 1934—Continued

State and city	Meningococcus meningitis		Polio-myelitis cases	State and city	Meningococcus meningitis		Polio-myelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts				Delaware			
Boston	0	0	1	Wilmington	0	0	1
New York				Tennessee			
New York	4	3	1	Memphis	2	0	0
Syracuse	1	0	0	Alabama			
New Jersey				Birmingham	0	0	1
Camden	0	1	0	Louisiana			
Pennsylvania				New Orleans	1	0	0
Philadelphia	0	0	3	Washington			
Ohio				Seattle	0	0	2
Columbus	1	1	0	Tacoma	0	0	1
Illinois				California			
Chicago	8	2	0	Los Angeles	1	0	4
				San Francisco	0	0	1

Pellagra—Cases Boston, 1, Philadelphia, 1, Charleston, S C, 6, Savannah, 1, Miami, 1, Mobile, 1; Montgomery 1, San Francisco, 1

Lethargic encephalitis—Cases New York, 1, Philadelphia, 1, Detroit, 4, St Joseph, 1, Atlanta, 1, Los Angeles 1

Typhus fever—Cases Houston, 3

FOREIGN AND INSULAR

CANADA

Ontario Province—Communicable diseases—5 weeks ended December 30, 1933.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 5 weeks ended December 30, 1933, as follows

Disease	Cases	Deaths	Disease	Cases	Deaths
Actinomycosis	1		Paratyphoid fever	2	
Cerebrospinal meningitis	2	1	Pneumonia		205
Chicken pox	1,159		Poliomyelitis	5	
Diphtheria	49	4	Scarlet fever	767	3
Dysentery	1		Septic sore throat	10	
Erysipelas	17	2	Syphilis	293	1
German measles	7		Tetanus		1
Gonorrhea	338		Trench mouth	1	
Influenza	25	13	Tuberculosis	190	61
Lethargic encephalitis		2	Typhoid fever	31	
Measles	43		Undulant fever	4	
Mumps	331		Whooping cough	290	2

Quebec Province—Communicable diseases—2 weeks ended January 13, 1934.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended January 13, 1934, as follows

Disease	Cases	Disease	Cases
Chicken pox	401	Puerperal septicemia	1
Diphtheria	43	Scarlet fever	155
Erysipelas	13	Tuberculosis	103
German measles	1	Typhoid fever	26
Influenza	6	Whooping cough	173
Measles	59		

MEXICO

Matamoros—Malaria.—According to a report dated November 10, 1933, there was an epidemic of malaria in Matamoros, Mexico, and surrounding district During the week ended November 4, 1933, 17 deaths were reported at Matamoros from malaria, or complications in which malaria was an important factor. During the year 1932, 21 deaths from malaria were reported in Matamoros, while from January 1 to November 4, 1933, 52 deaths had been reported from this disease.

The epidemic was attributed to the heavy rainfall and floods which occurred in this region during the summer and early fall of 1933. A campaign for the destruction of mosquitoes was being carried on, and quinine was being distributed by health officials

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Jan 26, 1934, pp 128-139 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Feb 23, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands—During the week ended January 20, 1934, cholera was reported in the Philippine Islands as follows Bohol Province—Antequera, 18 cases, 12 deaths, Calape, 13 cases, 14 deaths, Cortes, 12 cases, 7 deaths, Loon, 11 cases, 8 deaths, Maribojoc, 6 cases, 2 deaths; Tagbilaran, 5 cases, 2 deaths, Talibon, 13 cases, 10 deaths, Tubigon, 15 cases, 11 deaths Cebu Province—Alegria, 1 case, 1 death; Argao, 1 case, 2 deaths, Carcar, 1 case, 2 deaths; Cebu City, 1 case, 1 death, Guinapilan, 1 case; Samboan, 1 case, 1 death Occidental Negros Province—Calatraba, 6 cases, 6 deaths, San Carlos, 3 cases, 4 deaths. Oriental Negros Province—Ayuquitan, 1 case, Tanjay, 36 cases, 21 deaths

Plague

China—Manchuria.—A report dated December 15, 1933, states that 4 new cases of plague occurred at Tungliao, Manchuria, China, on December 4, 1933, and that the total number of deaths from plague in Manchuria from the beginning of the outbreak was 1,200

Hawaii Territory—Paauilo.—On January 13, 1934, 1 plague-infected rat was reported in Paauilo, Hamakua District, Hawaii.

Union of South Africa—Transvaal.—During the week ended December 2, 1933, 1 fatal case of plague was reported on the farm Shenfield, Transvaal Province, Union of South Africa.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 6

FEBRUARY 9 - - - 1934

IN THIS ISSUE

Sensitivity of Bacteria to Beta and Gamma Radium Rays
Use of Liquid Sulphur Dioxide as a Fumigant for Ships
Deaths in Large Cities During Week Ended January 20
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

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CONTENTS

Page

The sensitivity, in vitro, of bacteria to the beta and gamma rays of radium — 183
Liquid sulphur dioxide as a fumigant for ships — 192
Court decision relating to public health — 208
Deaths during week ended January 20, 1934
    Deaths and death rates for a group of large cities in the United States — 210
    Death claims reported by insurance companies — 210

PREVALENCE OF DISEASE

United States:
    Current weekly State reports
        Reports for weeks ended January 27, 1934, and January 28, 1933 — 211
    Summary of monthly reports from States — 213
    Weekly reports from cities:
        City reports for week ended January 20, 1934 — 215
Foreign and insular.
    Canada—Provinces—Communicable diseases—2 weeks ended December 30, 1933 — 218
    Czechoslovakia—Communicable diseases—November 1933 — 218
    Italy—Communicable diseases—4 weeks ended August 20, 1933 — 218
    Virgin Islands—Notifiable diseases—November–December 1933 — 219
    Cholera, plague, smallpox, typhus fever, and yellow fever—
        Cholera — 219
        Yellow fever — 219

PUBLIC HEALTH REPORTS

VOL. 49 FEBRUARY 9, 1934 No. 6

THE SENSITIVITY, IN VITRO, OF BACTERIA TO THE BETA AND GAMMA RAYS OF RADIUM

By R R. SPENCER, *Surgeon, United States Public Health Service*

It is generally agreed among radiologists that the young and actively growing cells of the human body are more radiosensitive than old or adult cells, the metabolism of the latter being very much slower It is further recognized that cells of one type vary in radiosensitivity from cells of another type Thus, for example, the lymphocytes, whose metabolic cycle among human cells is the shortest, are also the most radiosensitive, and the nerve cells, whose life cycle is the longest, are the most resistant to radiation

In view of these observations (6) one would expect not only the radiosensitiveness of bacterial species to vary a great deal but that the rapidly multiplying cultures would be more sensitive than cultures at rest However, according to the observations recorded here, it is the rapidly multiplying cultures tha are least sensitive to the beta and gamma rays of radium, while resting bacteria, in contrast with the least active human cells, are the most sensitive [1]

Review of the literature.—The earliest report of the effect of the radiation from radioactive substances upon bacteria seems to be that of Pacinotti and Parcelli (16). In 1899 Pacinotti and Parcelli exposed various bacteria (*B proteus, Vibrio cholerae, B. typhosus,* and *B. diphtheriae*) to preparations of powdered uranium and found that the organisms were killed. At that early date, of course, they did not test separately the effect of the alpha, beta, and gamma rays.

[1] It should be recalled that the radiant energy emanating from radium consists of the alpha, the beta, and the gamma rays

The alpha rays consist of a stream of material particles which are projected at high speed from radioactive substances The alpha particles from all types of radioactive matter are identical in mass and consist of charged atoms of helium projected at velocities of about 10,000 miles a second The alpha particles are expelled with a characteristic speed from each radioactive substance and have a definite distance of travel or range in matter before they are stopped The range of the alpha particles for different radioactive substances varies between about 3 and 11 centimeters in air at atmospheric pressure and temperature Most of the energy emitted from radioactive bodies is in the form of alpha rays The alpha rays are easily absorbed and are stopped by a sheet of paper or a few centimeters of air.

The beta rays consist of a stream of electrons which are projected at high velocities approaching in some cases that of light Unlike the emission of alpha particles, a radioactive body emits beta particles over a considerable range of velocity

The gamma rays, which are of very penetrating character, have been shown to be a type of X-rays of very high frequency. Usually the gamma rays accompany the emission of beta rays Unlike the alpha and beta particles, the gamma rays are undeflected by a magnetic field.

Henri and Mayer (11) found that radium rays rapidly destroy the activity of the ferments, invertin emulsin, and trypsin.

Dauphin (5) concluded from his tests that the rays of radium stop the growth of mycelium of the Mortierella (mold) and prevent germination of the spores The action is considered as paralyzing, causing the appearance of real cysts in the interior of the filaments, and the cysts were considered as organs of defense He also concluded that spores and mycelium submitted to the action of radium are not killed but remain in a latent state of life and when replaced in a normal condition can once more germinate or continue to develop afresh

Bouchard and Balthazard (1) exposed *B pyocyaneus* to the emanations from radium (randon gas) and produced a reduction in virulence and an increase in involution forms When exposed to larger doses over a longer period, the organisms were destroyed, as shown by failure of growth when irradiated cultures were transplanted.

Iredell and Minett (12) exposed plates inoculated with *B. pyocyaneus* for 10, 20, and 60 minutes to radium rays. The radium salts were applied directly to the surface of the media Transfers were made from exposed and unexposed cultures (controls) and from exposed and unexposed areas on the same plates The capacity for staining, growth, and reproduction was unimpaired and no differences could be detected. The quantity of radium employed was not stated, and the only observation made was a slight increased tendency to spore formation after 60 minutes' exposure *Staphylococcus aureus* and *B megatherium* were also unaffected. *B. coli* exposed for 17 hours was unaffected and grew normally on Conradi-Drigalski medium

Hans Jansen (13) found that *B prodigiosus* was killed when the air above the culture on a slant agar surface contained at least 345 Mache units of emanations per cc over a period of 48 hours. He concluded that the effect was not due to changes in the media and that the bactericidal effect was due to the alpha rays.

Fabre (7) found that anthrax organisms spread on plates and exposed to alpha, beta, and gamma rays of radioactive substances always gave a smaller number of colonies than the control plates not irradiated. When fresh plates were planted from the colonies developed under irradiation, only slight differences were observed in the number of colonies appearing on control plates and on the plates seeded from the irradiated colonies. With gonococcus, however, transplants from the colonies developing under irradiation gave no growth at all.

Chambers and Russ (3) state that it is the alpha and beta rays that have the bactericidal effect. These rays from a comparatively small quantity of radium, a few milligrams, have a direct bactericidal

effect; but exposure of a suspension of *Staphylococcus aureus* to the gamma rays only, 7 milligrams of radium bromide, gave no evidence of any effect after an exposure of one week. When the beta rays from the same source were utilized, a completely lethal effect was obtained in 6 hours.

Mottran (15) states that both animal and vegetable cells show a disturbance of normal growth when submitted to the gamma and beta rays of radium. This disturbance is more marked if the cells are in active division Dividing ova of *ascaris* are at least 8 times as vulnerable as resting ova The most vulnerable stage in division is the metaphase. Beta and gamma radiation is followed by profound nuclear changes affecting the chromatin, and such changes are less marked if the cells have been irradiated in a resting condition

Lequeux and Chomé (14) state that the action of radium salts varies with the microbe and the salts employed and that the gamma rays have only a questionable effect.

Cluzet, Rochaix, and Kofman (4), using 50-milligram tubes of radium bromide employed in radium therapy, found no effect upon *B. pyocyaneus* after 24 hours' exposure Even after 3 days' and in another experience after 5 weeks' exposure, transfers from irradiated cultures showed no differences in abundance of growth or in morphology. They did note, however, that when cultures of *B. pyocyaneus* were irradiated in the ice box for 7 days and then incubated they were destroyed, while control cultures developed abundantly when placed in the ice box for the same period and then incubated Typhoid bacilli were destroyed after 12 days' irradiation in the ice box The action was not due to the irradiation affecting the broth media, since media irradiated 7 days and then planted with organisms gave good growth The dose of irradiation which is bactericidal varies with the species and the strain of the same species The authors gave no explanation for the marked difference in results with the same organism irradiated in the ice box and in the incubator (See p. 190.)

Bruynoghe and Mund (2) state that the gamma rays are without action on bacteria but that the alpha and beta rays are distinctly bactericidal. According to the same authors, the bacteriophage of typhoid after 3 days' contact with 7 to 8 millicuries of radium emanation was unaffected

It is generally agreed that the X-rays and the radium rays have the same general effect upon living tissue. Young or immature cells are more radio-sensitive than old or adult cells, and this has been generally recognized as the essential foundation of radiotherapy. According to Desjardins (6), "each variety of cell in the body has a specific sensitiveness or rather a specific range of sensitiveness to radiation." Further, "The specific sensitiveness of each kind of cell

looms up as the dominant single fact of radiology and deserves to be recognized as a law * * *. Although the factors responsible for such specificity have not yet been determined, the sensitiveness peculiar to each kind of cell appears to be related chiefly to the natural life cycle Thus the lymphocytes, whose metabolic cycle among human cells is the shortest, are also the most radio sensitive, and the nerve cells, whose life cycle is the longest, are also the most resistant to radiation."

Gurwitsch (8, 9, 10) has observed that dividing cells (onion roots) emit a radiation of a frequency in the ultraviolet of 2,000 to 2,400 Ångstrom units, and that this radiation has the property of stimulating the process of cell division in neighboring cells

DESCRIPTION OF RADIUM NEEDLES EMPLOYED

(*a*) *Monel metal needles*—Length 14 5 mm; external diameter 1 25 mm; wall thickness 0 25 mm Each of these needles has a gamma radiation equivalent approximately to that from 5 milligrams of radium element, according to the United States Bureau of Standards certificate, when corrected to allow for the wall absorption. The Monel metal of which the needles are made is an alloy containing 28 percent copper, 67 percent nickel, and 5 percent iron, silica, and other impurities It screens off 85 percent of the primary beta radiation and has a density of 8 7.

(*b*) *Platinum-iridium needles*—Length 44.0 mm, external diameter 1 65 mm; wall thickness 0 5 mm These needles have a gamma radiation equivalent to that from 10 mg of radium element according to the United States Bureau of Standards certificates when corrected to allow for the wall absorption The platinum-iridium has a density of 21 5 and screens off approximately 99 percent of the primary beta radiation.

EXPERIMENTAL DATA

When one loop of a 24-hour broth culture of *B. typhosus*, *Streptococcus scarlatinae*, or *B. proteus* X_{19} is planted in a broth tube with one or as many as seven 5-milligram radium needles and incubated at 37° C. a decided retardation of growth takes place during the first 6 or 8 hours when compared with a similarly inoculated nonirradiated control. After 24 hours, however, there may be no marked differences in the density of growth, especially if only one or two needles are employed. If transfers are continued daily in two series, one being irradiated and the other serving as control, frequently but not invariably a denser growth will be observed in the tubes of the irradiated series after 8 or 10 transfers. Accompanying the heavier growth one will notice that there is a tendency to longer chain formation in

the case of the irradiated streptococci and to the formation of long filamentous forms in the case of the irradiated typhoid and proteus organisms Furthermore, the organisms seem to stain more deeply and generally appear more vigorous Motility is not apparently affected.

On the other hand, if these organisms are irradiated in the ice box at about 0° C , at which temperature metabolism, growth, and multiplication have been brought practically to a standstill, the organisms are gradually killed.

TABLE 1 —*Irradiation of B typhosus Colony counts of duplicate sets of broth suspensions of B typhosus stored at 0° C*

Tube number and contents	Amount of inoculum	After 7 days' storage	After 14 days' storage	After 18 days' storage
	cc			
1 5 cc broth	0 1	Innumerable colonies in 1/10 cc	Innumerable colonies in 1/10 cc	Innumerable colonies in 1/10 cc
1A 5 cc broth, 5 mg radium	1	0	0	0
2 5 cc broth	2	Innumerable colonies	Innumerable colonies	Innumerable colonies.
2A 5 cc broth, 5 mg radium	2	0	0	0
3 5 cc broth	3	Innumerable colonies	Innumerable colonies	Innumerable colonies.
3A 5 cc broth, 5 mg radium	3	0	0	0
4 5 cc broth	4	Innumerable colonies	Innumerable colonies	Innumerable colonies
4A 5 cc broth, 5 mg radium	4	0	0	0
5 5 cc broth	5	Innumerable colonies	Innumerable colonies	Innumerable colonies
5A 5 cc broth, 5 mg radium	5	71 colonies in 1/10 cc	3 colonies in 1/10 cc	0
6 5 cc broth	6	Innumerable colonies	Innumerable colonies	Innumerable colonies.
6A 5 cc broth, 5 mg radium	6	59 colonies in 1/10 cc	5 colonies in 1/10 cc	0
7 5 cc broth	7	Innumerable colonies	Innumerable colonies	Innumerable colonies.
7A 5 cc broth, 5 mg radium	7	98 colonies in 1/10 cc	5 colonies in 1/10 cc	0

From table 1 it may be seen that when as much as 0 4 cc of a 24-hour broth culture is placed in 5 cc of broth with one 5 mg radium needle (Monel metal) and stored at 0° C , the organisms are killed within 7 days When as much as 0 7 cc of the same culture is planted in a similar tube of broth and irradiated at 0° C the number of living organisms gradually decreases and all are killed within 18 days. In all the nonirradiated control tubes there was no evidence of either a reduction or multiplication of the bacteria

A study of table 2 reveals the fact that when 0.1 cc and 0 2 cc of living typhoid organisms are inoculated into autoclaved suspensions of the same strain and irradiated at 0° C., the organisms survive 14 days but are killed in 21 days. When this result is compared with that recorded in table 1 it will be seen that the presence of the dead suspensions tends to protect the living organisms from the rays of radium.

TABLE 2 —*Irradiation of B typhosus Colony counts of duplicate sets of suspensions B typhosus planted in a killed broth suspension of B typhosus tubes stored at 0° C*

Tube number and contents	Amount of inoculum	After 7 days' storage	After 14 days' storage	After 21 days' storage
	cc			
1 Killed suspensions of B coli	0 1	Innumerable colonies in 1/10 cc	Innumerable colonies in 1/10 cc	Innumerable colonies in 1/10 cc
1A Killed suspensions of B coli and 5 mg radium	1	200+colonies in 1/10 cc	Growth in water of condensation only	No growth
2 Killed suspensions of B coli	2	Innumerable colonies in 1/10 cc	Innumerable colonies in 1/10 cc	Innumerable colonies in 1/10 cc
2A Killed suspensions of B coli and 5 mg radium	2	200+colonies in 1/10 cc	14 colonies	No growth

Table 3 likewise shows that 0 15 percent agar and 12½ percent gelatine have a decided protective effect against the rays of radium There was no perceptible decrease in organisms in the irradiated tubes containing agar and gelatine when compared with the control tubes containing these substances but not irradiated A suspension of kaolin, however, did not protect as well as the gelatine or agar.

TABLE 3 —*Irradiation of B typhosus Colony counts of duplicate sets of broth suspensions of B. typhosus stored at 0° C*

Tube number and contents	Amount of typhoid inoculum	After 7 days' storage	After 14 days' storage
	Cc		
1. 5 cc of 0 15 percent agar	0 1	Innumerable colonies in 1/10 cc	Innumerable colonies in 1/10 cc
1A 5 cc of 0 15 percent agar, 5 mg radium	.1	do	Do
2 5 cc of 12½ percent nutrient gel	1	do	Do
2A 5 cc of 12½ percent nutrient gel, 5 mg radium	.1	do	Do
3 4 cc broth, 1 g kaolin	1	do	Do
3A. 4 cc broth, 1 g kaolin, 5 mg radium	1	10 colonies in 1/10 cc	No growth
4 5 cc broth	1	Innumerable colonies	Innumerable colonies.
4A 5 cc broth, 5 mg radium	.1	No growth	No growth

In table 4 is recorded the results of irradiating a gram-negative nonmotile bacillus at 37° C. rather than at 0° C This organism was carefully tested a number of times and always failed to grow at 37° C. Good growth was obtained, however, at room temperature and in the ice box at about 10° C. It was recovered as a contaminant from a commercial antiserum but was not further identified

The table shows that when 0 1 and 0.2 cc of a 48-hour broth culture of this organism were planted in 5 cc of broth and irradiated at 37° C. the organism was killed. Nonirradiated controls were not killed. When a single loop-full of a broth culture (grown at room temperature, 25° C.) was planted in 5 cc of fresh broth and irradiated at 10° C. a good growth was observed within 48 hours.

When the results of irradiating this organism, which does not grow at 37° C, are compared with the irradiation of *B. typhosus* one obtains the impression that the metabolic condition or state of an organism is a most important factor in its vulnerability to the rays of radium, while the temperature *per se* at which the organism is irradiated does not seem to play an important role. But temperature, of course, largely controls metabolism when other conditions are favorable for growth and thus indirectly influences the vulnerability of organisms to radium

TABLE 4—*Irradiation of a bacillus that does not grow at 37° C Colony counts of duplicate sets of broth suspensions stored at 37° C*

Tube number and contents	Amount of inoculum	After 4 days' storage	After 7 days' storage
	Cc		
1 5 cc broth	0 1	Innumerable colonies in 1/10 cc	Innumerable colonies in 1/10 cc.
1A 5 cc broth, 5 mg radium	1	No growth in 1/10 cc	No growth in 1/10 cc
2 5 cc broth	2	Innumerable colonies in 1/10 cc	Innumerable colonies in 1/10 cc.
2A 5 cc broth, 5 mg radium	2	Growth in water of condensation only	No growth in 1/10 cc

In table 5 evidence is submitted which we believe shows conclusively that it is the beta rays rather than the gamma which possess predominantly the killing effect. It will be noted that in tube no. 2, in which *B typhosus* was irradiated with 5 milligrams of radium, the organisms were all killed within 1 week, whereas in tube no. 3, in which a corresponding suspension was irradiated with a 10-milligram needle, 300 colonies were obtained from 1/10 cc of the irradiated suspension. However, only 1 percent of the irradiation from the 10-milligram platinum-irridium needle was the beta rays while 15 percent of the radiation from the 5-milligram Monel metal needle was of the beta variety. In other words, there was 7½ times as much beta radiation emanating from the 5-milligram needle as from the 10-milligram needle.

TABLE 5—*Irradiation of B typhosus Colony counts of broth suspensions stored at 0° C, showing killing effect of the beta rays*

Tube number and contents	Amount of inoculum	After 7 days' storage	Remarks
	Cc		
1 5 cc broth	0 1	Innumerable confluent colonies in 1/10 cc	Control not irradiated
2 5 cc broth, 5 mg radium in Monel metal needle	1	No growth in 1/10 cc	Needle emanates 85 percent gamma rays and 15 percent beta.
3 5 cc broth, 10 mg radium in platinum-irridium needle	.1	300+ colonies	Needle emanates 99 percent gamma and 1 percent beta rays.

We have also studied the effect of radium emanations upon *S. scarlatinae* and *B proteus* X_{19} with practically identical results as those recorded above for *B. typhosus*.

DISCUSSION

In previous studies referred to, it is claimed that both the alpha and the beta rays are bactericidal, but that the gamma rays have no appreciable effect upon bacteria Neither of the two varieties of needles that we have used in this study permit the passage of the alpha particles. Our needles are essentially similar to those usually employed in the treatment of cancer and in other radio-therapeutic procedures, and unfortunately no needle is manufactured, so far as we are aware, which completely excludes all of the beta rays

The brief study of Cluzet, Rochaix, and Kofman (4) is the only reference in the literature, so far as we have been able to find, in which a difference was noted between the sensitivity of bacteria to radium when irradiated at 37° C and at ice box temperatures These authors gave no explanation for their findings Our studies, on the other hand, seem to connect definitely the degree of sensitivity of bacteria to irradiation with the degree of metabolism, growth, and reproduction of the organisms

While our studies support the view expressed by many previous workers that the beta rays are bactericidal, they also suggest that bacteria in an optimum media and temperature, and where growth and multiplication are rapid, are not perceptibly injured, but their growth may, on the other hand, be stimulated

These results fit in with what is known regarding the sensitivity of animal tissue cells to radium in that the sensitivity seems to be related to the metabolic rate However, the statement of radiologists that the most active cells in the human body are the most sensitive to radium and that cells with a low metabolic or reproductive rate are less sensitive seems to be the exact opposite of our results upon bacteria.

Since our work was completed we have seen a recent editorial in the Lancet (Sept 9, 1933) discussing the work of Crabtree and Cramer (Proc. Roy. Soc. B 1933, CXIII, 226). These authors found that "low temperatures which retard all cell processes, including respiration, hydrocyanic acid in suitable dilution, and simple Ringer's solution (nonoxygenated and lacking glucose and bicarbonate) markedly increased radiosensitivity as measured on thin sections of Jensen's rat sarcoma."

This observation upon the sensitivity of rat sarcoma cells seems contrary to the generally accepted idea regarding the radiosensitivity of tissue cells, but it is in complete accord with our observations upon the radiosensitivity of bacteria.

The results that we have obtained so far in the irradiation of bacteria can all be attributed to the effect of the beta rays, and we have no conclusive evidence that the gamma rays affect bacteria in any way, despite the fact that some of our needles emanate 99 percent gamma and only 1 percent beta rays This result is in accord with the work of previous investigators and, in addition, suggests that the sensitivity of bacteria to irradiation varies inversely with the metabolic rate.

These results have also suggested to us the use of radium in the production of bacterial variants or mutants Our observations in this field will be the subject of a future communication.

SUMMARY

The effect of radium rays (beta and gamma) upon broth cultures of actively multiplying bacteria is first manifested by a retardation of growth within the first 6 hours after planting. When observed after 24 hours there may be no perceptible difference between the gross appearance of irradiated and nonirradiated cultures.

After several transfers the continuously irradiated cultures may be stimulated to a more vigorous growth, and the organisms tend to display pleomorphism and stain more deeply

Bacteria kept at sufficiently low temperatures to prevent multiplication are gradually killed by the irradiation. The lethal effect appears to be due to the beta rays

These experiments suggest rather strongly that the sensitivity or vulnerability of bacteria to radium rays is in some way associated with the activity of the cell.

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LIQUID SULPHUR DIOXIDE AS A FUMIGANT FOR SHIPS

By C L WILLIAMS, *Senior Surgeon, United States Public Health Service*

Part I. Advantages, Methods, Apparatus, and Costs

Since the development of hydrocyanic acid for fumigation purposes, sulphur dioxide has largely passed out of use in the United States. The change of procedure is clearly shown in the number of ships fumigated for quarantine purposes by the two methods Prior to 1914, practically 100 percent of vessels fumigated were treated with sulphur, while in 1932 this figure had dropped to 6 5 percent for ships fumigated at continental United States ports, and at insular ports hydrocyanic acid had largely displaced sulphur, except in the Philippines.

The absolute figures for the fiscal year ended June 30, 1932, as taken from the annual report of the Surgeon General, are as shown in table 1

TABLE 1 —*HCN and sulphur fumigations during fiscal year ended June 30, 1932*

Ports	Number using HCN	Number using SO_2	Percent using SO_2
Continental United States ports	1,321	93	6 5
Insular United States ports			
Philippine Islands	72	500	89 2
All others	46	8	17 4

Despite this obvious trend, however, it does not appear at the present writing [1] that HCN will entirely displace SO_2 for the fumigation of ships for quite some years to come At the smaller quarantine stations, where only a few ships are fumigated each year, there are obvious economic objections to maintaining crews of highly trained cyanide fumigators when these vessels can be fumigated with reasonable effectiveness with SO_2 in the hands of relatively untrained station laborers.

[1] May 1933.

DISADVANTAGES OF BURNING SULPHUR

There is no point in reciting here the numerous advantages that HCN holds over SO_2 as a fumigant. Discussion will, therefore, be restricted to methods of using the latter material. In different parts of the world, these include:

1. Burning sulphur in pots or pans in the spaces to be fumigated.
2. Burning carbon disulphide ("Salforkose" process) in the spaces to be fumigated
3. Burning sulphur in special furnaces and pumping the fumes, by means of blowers, into the ship (Clayton apparatus).
4. Passing liquid SO_2 through a furnace to convert it into a gas, and blowing it into the ship (Marot process).
5. Introducing liquid SO_2 into the ship and permitting it to evaporate therein

The first of these procedures involves the use of a large amount of material and apparatus, innumerable pots and pans of water, inflammable material for igniting sulphur, scales for weighing it, etc. After the fumigation, all of the apparatus must be gathered and removed. The operation itself involves a distinct fire hazard.

The Salforkose method involves the use of less apparatus, but somewhat increases the fire hazard.

All methods wherein SO_2 is produced outside the ship and blown in involve the use of heavy, cumbersome apparatus, specially constructed for the purpose.

Of all the methods listed above, the first named—that is, burning sulphur in pots—is by far the least accurate. There are two main causes for this: One is that, in a considerable proportion of the pots, some of the sulphur remains unburned; the second is that, as a rule, burning requires several hours, the result being that the theoretical concentration of SO_2 is never reached, the quantity actually produced varies greatly, and maximum concentration appears late. In the Salforkose process the material is rapidly and completely burned, making it a procedure of greater accuracy. In all methods whereby the gas is produced outside the ship and blown in, in order to secure accurate dosage it is necessary actually to make tests of the concentration produced in the various compartments fumigated.

LIQUID SULPHUR DIOXIDE

The advantages of liquid SO_2 directly applied are that accurate doses may be introduced, fire hazard is obviated, and much cumbersome apparatus is eliminated. Its disadvantages are that it is at present supplied to the market in relatively heavy units and its cost is relatively high.

Liquid SO_2 is a highly volatile fluid, with a boiling point of 11° F. It is stored and shipped in heavy steel cylinders or strong tanks, in which at ordinary temperatures the material is kept liquid through a self-generated gas pressure of from 50 to 100 pounds.

Liquid SO_2 is on the market in quantity in two grades The cheaper, which is quite satisfactory for fumigation, is described as anhydrous liquid SO_2 containing less than 0 1 percent water. This grade is at present supplied in cylinders holding 150 pounds each (tare approximately 130 pounds, total weight approximately 280 pounds), and in drums holding 1 ton each (tare 1,000 pounds) It may also be purchased in tank-car lots. The higher and more expensive grade of SO_2, generally supplied for refrigeration purposes, may be obtained in cylinders holding 35, 10, 5, and 2 pounds.

HANDLING SULPHUR-DIOXIDE CYLINDERS

A steel cylinder of SO_2 with a total weight of 280 pounds cannot be handled by one man; it is a heavy load for two men, but not too heavy for manipulation once it is on the deck of the ship The points at which any material lifting must be done are in loading it onto a truck or boat at the quarantine station and in removing it from the truck or boat to the ship. At the quarantine station this difficulty should be overcome by the use of an inclined way or small hoist. At the ship it is practically necessary to secure the assistance of the crew. The cylinders may be hoisted to the ship's deck by swinging out one of the boat davits.

The handling of the heavy cylinders may be obviated by transferring the liquid from the large cylinders into small cylinders at the quarantine station. This involves an initial outlay for a supply of small cylinders, some 40 or 50 of which (35-pound size) would be required for fumigation of the average cargo vessel; it also involves considerable time to effect the transfer. It hardly seems to offer sufficient advantages to be worth while except at stations where the volume of fumigation is sufficient to warrant purchasing liquid SO_2 in 1-ton drums.

Liquid SO_2 in drums may be transferred into cylinders for use. The drums are fitted with a tube inside leading from the outlet valve to the periphery of the drum so that by rolling the latter into suitable position (indicated by the position of the valve), the contents may be drawn off either as gas or liquid.

This piping arrangement of the drum also permits that it be mounted on a truck or boat, taken to the ship's side, and the liquid SO_2 delivered directly into the ship through long delivery tubes. Used in this manner, in cold weather a provision would have to be made for pumping in air pressure or for heating the drum. Where a truck is assigned exclusively to fumigation, this provision may be

met by building into the body a sheet metal bed with double walls, between which the exhaust gases from the motor may be passed.

RELEASING LIQUID SULPHUR DIOXIDE

Liquid SO_2 may be taken from the cylinders in either of two ways. If the cylinder is placed upright—that is, with the valve at the top—and the valve opened, the accumulated gas under pressure will be blown off and can be led with a tube into the space to be fumigated. On the other hand, if the cylinder is inverted or tilted so that the valve is at the lowest point, and the valve opened, the contents will be forced out as a liquid, which, if sprayed, evaporates very rapidly. In use, of course, the outlet is connected with a delivery tube ending in a sprayer, which is carried into the compartment to be fumigated

The first procedure is quite limited in its application, owing to the fact that as soon as the accumulated gas in the top of the cylinder has blown off, the rate of delivery is markedly reduced, becoming progressively less and less until at ordinary temperatures it reaches a minimum of about 3½ pounds per hour From the 150-pound cylinder, about 25 pounds of gas can be obtained in the first half hour; thereafter the outflow will be at the minimum rate. The reason for this is that SO_2 has a sufficiently high latent heat of vaporization so that evaporation results in marked chilling, which, in turn, slows the rate of evaporation. This becomes readily apparent, in about one half hour after the valve has been opened, through the appearance of a heavy frost on the outside of the cylinder, which stops at the level of the liquid. Evaporation may be hastened by heating or, to a limited extent, by agitation.

On the other hand, introduction of the SO_2 by inverting the cylinder and forcing it out as a liquid through a sprayer can be accomplished quite rapidly. The gas pressure already in the cylinder is quite sufficient completely to empty the 150-pound size in 20 minutes. If sprayed into the top of a hold, it will appear as a heavy mist, which evaporates before it sinks to the bottom.

MEASURING LIQUID SULPHUR DIOXIDE

If it is desired that the amount of fumigant introduced be quite accurately measured, it is necessary to put the cylinder on its cradle on platform scales, note the progressive loss of weight, and close the valve when the desired amount has been introduced. For practical fumigation, however, this can be obviated by determining the discharge rate of the sprayer or sprayers used. This is accomplished by completely discharging a cylinder through the sprayer and noting carefully the time intervals for each 5 pounds of weight lost. With this rate once established, a very considerable amount of bother

incident to the carting around of the heavy platform scales can be eliminated, the amount of SO_2 introduced being calculated on the basis of the length of time it is permitted to flow. As the contents of the cylinder are discharged, evaporation within is sufficient to maintain pressure so that the rate of outflow is remarkably uniform.

APPARATUS REQUIRED

In addition to the cylinders of the fumigant, the only necessary apparatus includes wrenches to open and close the valve and to tighten the hose connections, a reducing connection to fit over the ¾-inch outlet of the cylinder at one end and receive the ¼-inch outlet hose coupling at the other, a 20-foot length of ¼-inch pressure tubing with ¼-inch pipe-thread couplings at either end, a sprayer to be attached to the end of the delivery tube, and a cradle for placing the cylinder in a tilted position Introduction can be materially speeded by supplying several outlet tubes, sprayers, and connections, as well as several cradles (or a cradle holding 2, 3, or more cylinders), so that as many cylinders as desired may be operated at one time.

SPRAYERS

Any type of sprayer may be used, but for practical fumigation it is necessary to adopt a type which will permit of a rapid flow. The one illustrated in figure 1, B and C, was constructed and used at the New York Quarantine Station, where it proved to be quite satisfactory. The rate of delivery was almost exactly 10 pounds per minute. Figure 3 shows the type of spray produced.

It is absolutely essential that the sprayer and the inside of the delivery tube be free from water. If even comparatively small amounts of water are present, the chilling caused by evaporation of the SO_2 will freeze the water in the narrow outlet of the sprayer and block it If the tube and sprayer are dry, however, it will function perfectly.

AMOUNT OF GAS AND PERIOD OF EXPOSURE

For fumigation by burning sulphur, the United States quarantine regulations prescribed that 3 pounds of this material be used for every 1,000 cubic feet of space, with exposure of 6 hours. The burning of this amount theoretically should produce a concentration in the air of 3 percent by volume. As a matter of fact, it is doubtful that it ordinarily produces a concentration higher than half of this figure. Furthermore, on account of its slow burning it seems reasonably clear that the maximum concentration does not appear until near the end of the prescribed period of exposure.

As opposed to these conditions, when liquid SO_2 is used the amount introduced into the fumigated space is accurately gaged and maximum

concentration produced at the beginning of the period of exposure. It would appear to be entirely logical, therefore, when this substance is used, to reduce either the prescribed amount of fumigant or the prescribed exposure, or possibly both. If a concentration of 3 percent by volume, as prescribed in the quarantine regulations, were to be used, it would be necessary to introduce approximately 6 pounds of liquid SO_2 for every 1,000 cubic feet of space If thereafter the exposure should be 6 hours, as prescribed in the regulations, we would have, in actual fact, about twice the concentration that would be secured by burning sulphur, applied over the same length of time It would appear reasonable, therefore, either to reduce the time of exposure by half—that is, to 3 hours—or to reduce the amount of gas by half—that is, to 3 pounds per 1,000 cubic feet.

The cheapest procedure would be to reduce the amount of gas, but there are a number of reasons for not reducing this below the amount that will produce a concentration of 2 percent by volume. One important one is that this is the standard that has generally been settled upon by investigators using SO_2 as a fumigant in foreign countries; another is that it has been determined (1) that this is the lowest concentration that will actually kill rats rapidly (within 5 to 10 minutes). Furthermore, it is known that SO_2 penetrates into enclosed spaces rather slowly. It does not, therefore, seem wise to reduce too much the period of exposure

With these considerations in mind, it is recommended that 4 pounds of liquid SO_2 be used per 1,000 cubic feet, and that the exposure—counting from the moment when the full charge of gas has been introduced—be 4 hours. In an experimental fumigation with this standard at the New York Quarantine Station it was found through actual titration of samples that, 1 hour after the gas was introduced, the concentration in a hold was 1 percent by volume, which progressively dropped until at the end of $5\frac{1}{2}$ hours it was 0.6 percent by volume, while at the same periods the concentration in a relatively tight pipe casing in the same hold was 0.5 percent and 0.4 percent by volume, respectively.

TOXICITY OF SULPHUR DIOXIDE

Sulphur dioxide kills rats and other warm-blooded animals through local irritation of the tissues of the lung. In concentrations of 2 percent by volume and higher, it will produce death in rats in from 5 to 10 minutes through causing edema of the lung (1). In tests carried out at the New York quarantine station it has been determined that approximately 0.1 percent by volume causes death of exposed rats in 2 to 4 hours; 0.2 percent causes death in 1 to 2 hours; 0.3 percent

causes death in 1 hour or less, and 0 5 percent by volume kills rats in ½ hour.

Applying these figures to the experimental ship fumigation cited in the preceding section, it will be seen that, during the period actually under test—that is, from 1 hour after introducing the gas until 5½ hours after introducing the gas—there was present in the hold a sufficient concentration to kill rats in less than ½ hour, and in the pipe casing sufficient concentration to kill rats in 1 hour or less

ABSORPTION OF SULPHUR DIOXIDE

Sulphur dioxide is readily absorbed by water, which takes up about 30 times its volume of the gas This is a matter of importance in ship fumigation, since the great majority of ships' holds are decidedly damp. In the experimental fumigation cited above, the drop of concentration from 2 percent by volume, as actually introduced, to 1 percent, as actually found on test 1 hour later, is ascribed to absorption on wet surfaces in the hold In the experiment, the ship's hold used was a thoroughly tight one, and during the course of the experiment no appreciable leakage through the tarpaulin over the hatch could be detected.

FUMIGATION OF LOADED SHIPS

The principal problem in the fumigation of loaded ships is to introduce the gas into all levels of loaded holds When sulphur is burned, it is possible to fumigate holds so loaded that the hatchway is left clear from the weather-deck through into the lower hold. With such an arrangement, the gas will pass fairly equally into all of the various levels. When, however, the hold is completely loaded so that the hatchways leading from shelter-deck to 'tween-deck and from 'tween-deck to lower hold are filled with cargo, it is not possible adequately to fumigate them by this method. The best that can be done in such a case is to remove sufficient of the cargo from the upper level to put the sulphur pots in place, and fumigate the upper level. A small amount of gas will penetrate by way of the ventilators into the lower levels, but not in sufficient amounts to kill rats.

With the various methods in which sulphur is burned outside the ship and the fumes blown into it, it is possible, of course, to blow the gas down the ventilators and thereby introduce it into the various levels. This method is probably not highly accurate, because obstruction to air currents is greater on the lower levels than on the upper levels. In consequence, one would expect the greater portion of the gas blown down a ventilator to pass into the highest level, a lesser portion into the intermediate levels, and the least into the lower hold. However, this tendency can be overcome by passing the tube from

the blower down the ventilators directly into the lower hold and thereafter into the various levels in turn.

Liquid SO_2, of course, can be readily sprayed into any desired level in a loaded hold by lowering the delivery tube, with the sprayer at the end, down the ventilator and guiding the sprayer into the lower hold and into the various levels in turn, spraying into each the amount of gas calculated for each level. The difficulty incident to such a procedure is that there appears at present to be little, if any, data available as to what damage may be done to the cargo by spraying directly on it some 100 pounds or so of liquid SO_2. With many types of cargo it can be reasonably stated that no material damage would ensue. These types include many of the bulk cargoes such as bulk grain, bulk linseed, ore, paper pulp, and similar materials. With various other cargoes, however, it seems likely that considerable damage might be done, although there is at present little data to show that such damage actually would occur. It is probable, however, that such commodities as coffee, rubber, flour, colored materials, and fabrics would be injured.

The only alternative to spraying the SO_2 as a liquid into loaded holds is to heat it in the container and blow it in as a gas. For reasonably accurate work, this entails apparatus for heating, as well as either an arrangement whereby the gas introduced might be weighed or the use of some type of gas meter that will indicate the number of cubic feet delivered.

The problem of metering the gas should not be too difficult; in fact, there are several types of gas-flow meters on the market that can be used for this purpose. The problem of supplying sufficient heat to vaporize the large amount of SO_2 required is a real one. In the Marot process the liquid is passed through a copper coil heated in one form of the apparatus by the exhaust from a gasoline motor.

Partly loaded holds in which the hatchway is clear down to the lower hold may be fumigated by spraying liquid SO_2 at the top of the hatchway without greater damage to cargo than is incident to burning sulphur in the hold.

In view of the small number of ships at continental United States ports required to be fumigated with SO_2 when fully loaded, it is believed that, in the cases that do occur, the most practical procedure would be to discharge cargo from the hatchways until these are clear and then fumigate. Since when using SO_2 there is no particular objection to permitting exposure to continue through the night, it would appear that there should be little, if any, additional delay to the ship incident to such a procedure.

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COSTS

At present writing, liquid SO_2 (commercial anhydrous containing less than 0 1 percent of water) is obtainable in 150-pound cylinders at 7 cents per pound f o b A deposit of $20 is required on each cylinder, which is refunded on return of the cylinder In 1-ton drums, the present price is 6 cents per pound f o b , with a deposit of $200 on each drum This grade of liquid SO_2 is not at present supplied in small-size containers; but, should a sufficient demand appear, it can probably be obtained in cylinders containing 35 pounds each, at a price of about 10 cents per pound. Deposits on this size cylinder are $10 each The prices quoted are for Norfolk, Va.

The average cargo ship is about 3,500 tons net. To fumigate such a ship with liquid SO_2, using 4 pounds per 1,000 cubic feet, would require very nearly 1,500 pounds. Purchased in 150-pound cylinders, this would cost, including freight, probably between $125 and $150.

REFERENCE

(1) Clark, G A. Rat destruction by sulphur dioxide Journal of the Royal Naval Medical Service, April 1932

Part II. Experimental Tests of Liquid Sulphur Dioxide [1]

THE EXPERIMENTS

The objects of the experiments were as follows:

1 To determine the time required to spray liquid sulphur dioxide.

2. To determine concentrations of the gas produced at various levels in the hold

3. To determine concentrations produced in enclosed spaces.

4. To determine rate of flow of sulphur dioxide when delivered from the cylinders as a gas

Location —The experiments were conducted in holds no 1 and no. 6 on the American S.S *President Fillmore* and at the New York quarantine station.

Material —The material used in these experiments was commercial anhydrous liquid sulphur dioxide, specified to contain not more than 0.1 percent water.

METHODS

Object 1.—A steel cylinder containing approximately 150 pounds of liquid sulphur dioxide was connected with an air pump, and air pressure was brought to 150 pounds per square inch (At the start of this operation it was noted that the gas pressure already in the cylinder was 50 pounds.) The cylinder was then disconnected from the air pump and placed on a cradle so that it was inclined, with the

[1] Communication to the Permanent Committee of the International Office of Public Hygiene at the meeting in May 1933; published in the Bulletin Mensuel for August 1933.

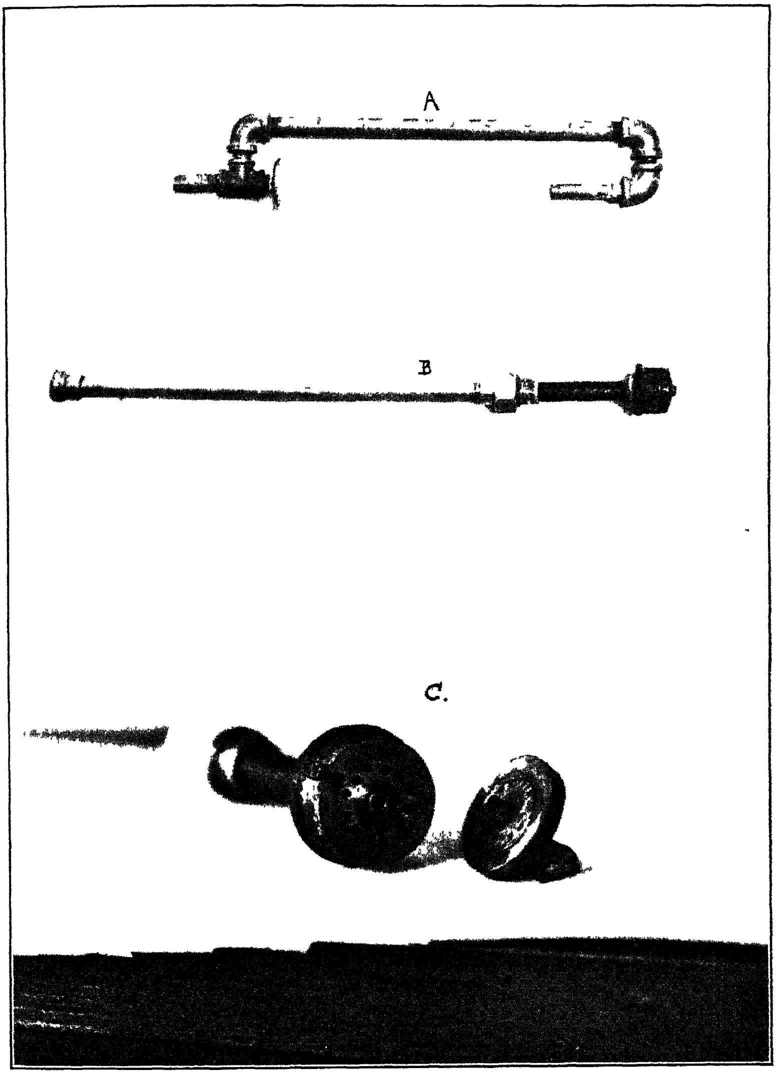

FIGURE 1—The sprayers used A, The stream of liquid SO_2 is directed against the disk, B, in this sprayer the liquid sprays out through a narrow slit near the end of the sprayer, shown taken apart in C, around the screw (in C) is a shoulder $\frac{1}{64}$ inch high, which sets the outlet at that width

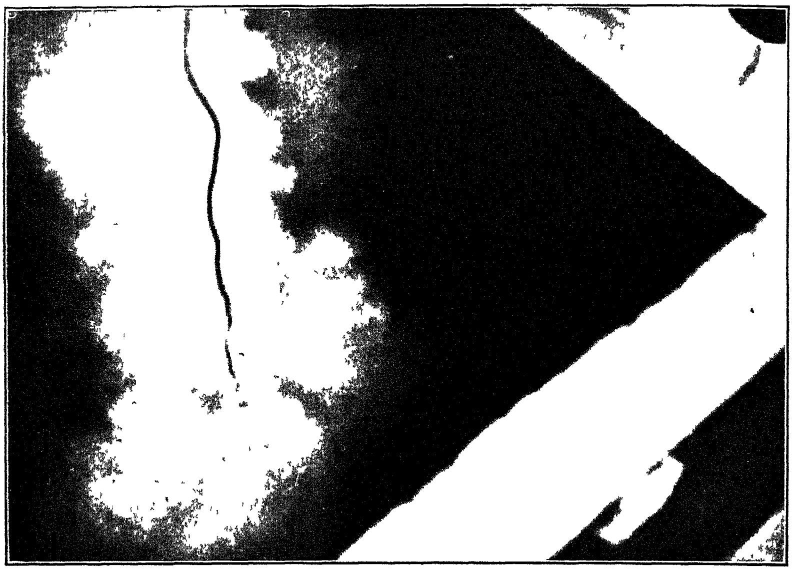

FIGURE 2 —Spray produced by the jet sprayer A, figure 1

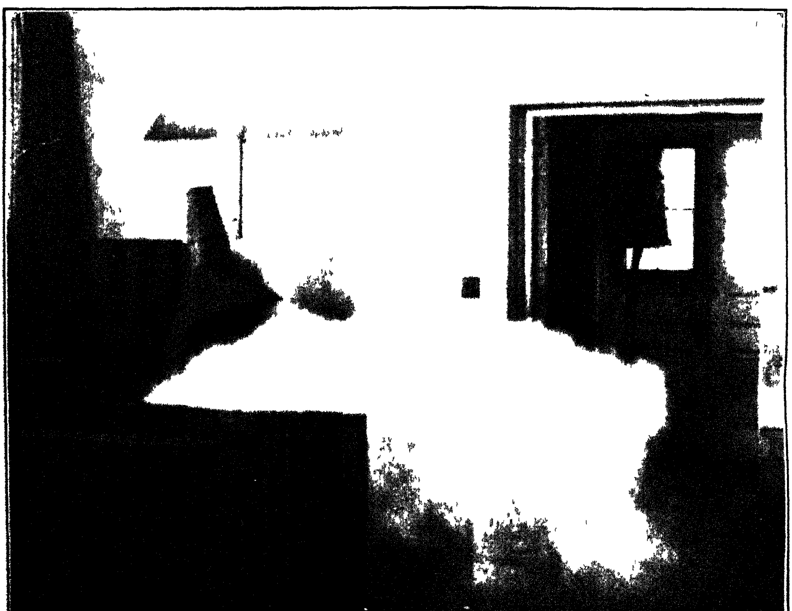

FIGURE 3 —Spray produced by sprayer B, figure 1

FIGURE 4.—The cylinder of liquid SO_2 shown on its cradle on the platform scales, the delivery tube has been attached and the fumigators are attaching a spray nozzle

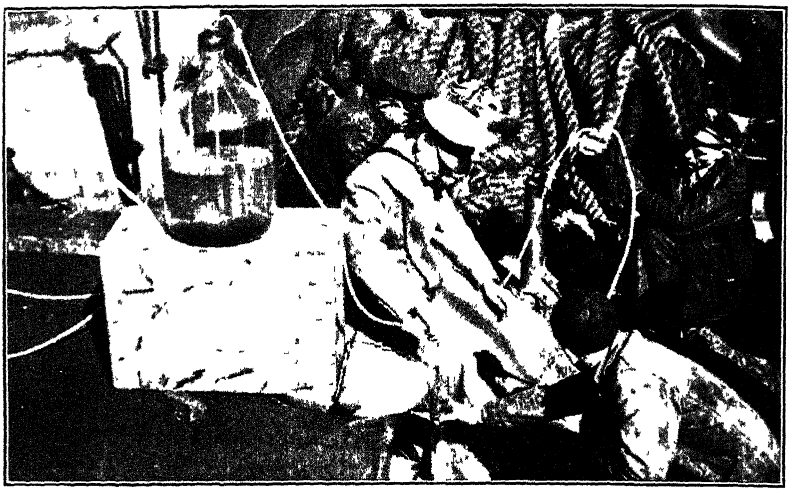

FIGURE 5.—Aspirating bottle and sampling tubes in operation

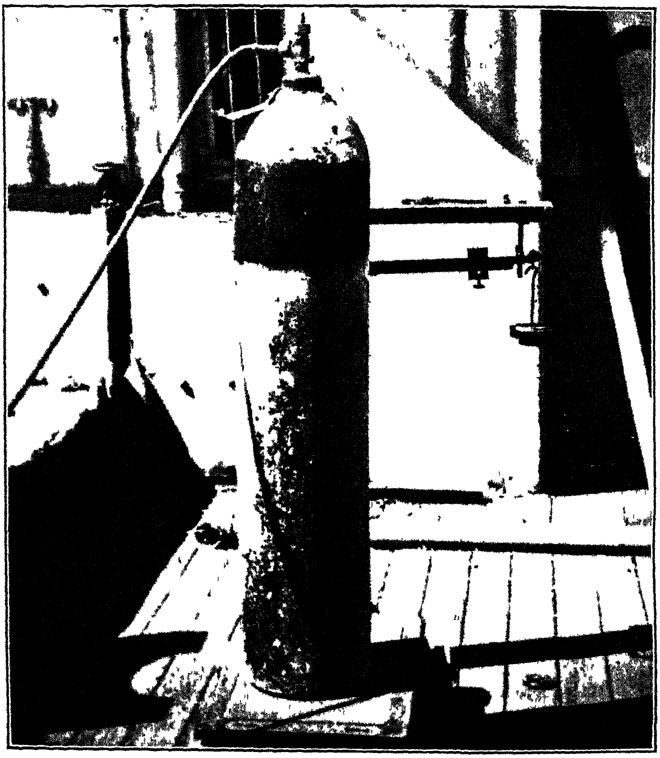

FIGURE 6.—Gaseous SO_2 being delivered by evaporation in the cylinder Note frost over lower part of cylinder (The top of the cylinder is painted white, the body black. The frost stops at the level of the liquid within)

valve at the bottom, and the cradle and cylinder were then placed on platform scales A ¼-inch flexible copper tubing was connected to the cylinder and a sprayer connected with the far end of the tubing, which was introduced into the hold. The valve of the cylinder was then opened wide Progressive loss of weight was noted on the scales, and the time required to deliver the gas was noted (fig. 4). This procedure was later repeated without adding any air pressure.

Two types of sprayer were tested One directed a jet against a flat surface (fig. 1A); the other was a disk sprayer (fig 1B) In operation, both of these sprayers broke the liquid sulphur dioxide up into a heavy mist (see figs 2 and 3)

Objects 2 and 3 —Prior to beginning fumigation, sampling tubes of rubber were introduced at various locations into the two holds fumigated (figs. 7 and 8), the free ends of the tubes being brought through the hatches onto the deck On the deck was set up an aspiration bottle, by means of which measured quantities of air were drawn through 0.1 normal iodine solution in order to titrate the SO_2 content The apparatus and its operation are shown in figure 5.

Hold no. 1 consisted of a shaftway the size of the hatch, passing down through two decks, below which it expanded into two 'tween-decks and a lower hold. The total capacity was 41,000 cubic feet. The total depth of the hold from the hatch coaming to the top of the deep tank was 58 feet. Over the top of the deep tank, however, was 8 feet of dirt ballast, in the center of which was built a well 3 feet square, which gave access to the manhole on top of the deep tank. This well was covered with loose boards, between which there were several cracks approximately one-half inch wide. One sampling tube (no. 4) was introduced to the bottom of this well. A second sampling tube (no 3) was introduced into the lower hold 4 feet above the level of the ballast. A third sampling tube (no 2) was at the first 'tween-deck, 20 feet from the top of the hatch. A fourth sampling tube (no. 1) was in the shaftway 6 feet from the top. A fifth sampling tube (no. 5) was in a relatively tight pipe casing on the second 'tween-deck at a point 30 feet below the hatch coaming. This pipe casing had a hole about 1½ inches square near the bottom, and two small openings about ½ inch square each near the top.

Hold no. 6 was blocked off by closing the hatchway between the first and second 'tween-decks, so that, for the purposes of this fumigation, it consisted of a shaftway similar to the one in hold no. 1 through two decks, below which it expanded into a series of cold-storage holds, the arrangement of which is shown in figure 8. Sampling tubes were placed in three of these cold-storage holds and in the open hold 25 feet below the hatch. None of these sampling tubes were in enclosed spaces, the object being to determine to what extent the gas would diffuse through the relatively small doors into these

compartments. In one compartment a tube was placed near the top and another one near the bottom

Object 4—To determine the rate of flow when delivered as a gas, a steel cylinder containing approximately 150 pounds of liquid sulphur

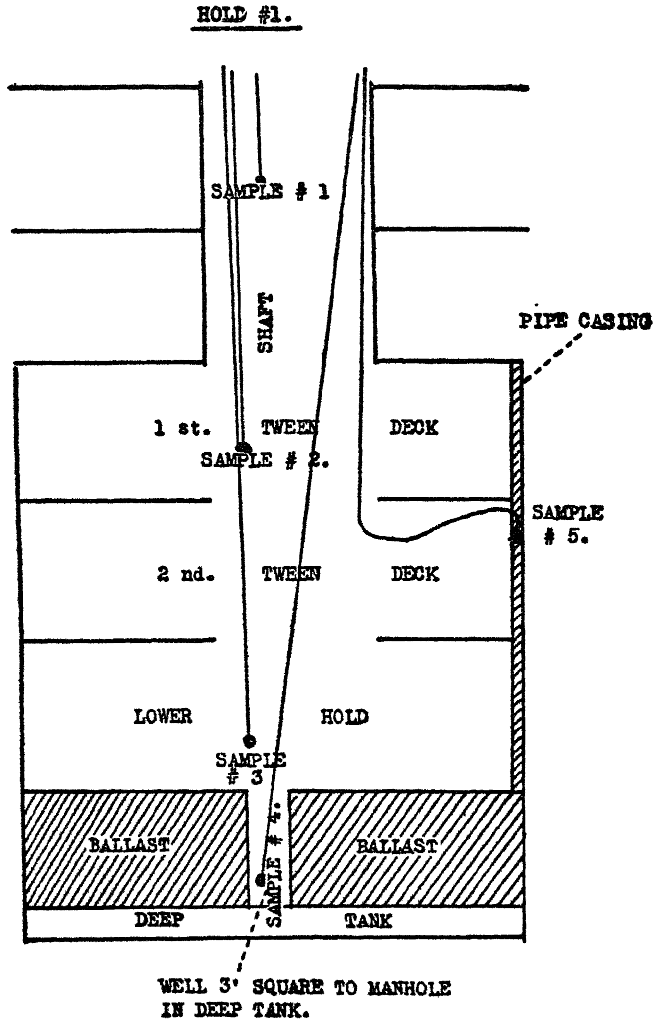

FIGURE 7—Longitudinal section through hold no 1, showing locations from which air samples were drawn

dioxide was placed upright on the platform scales. A 20-foot length of rubber tubing was led from the outlet of the cylinder into the hold. The valve was then opened and the gas permitted to flow. The amount of gas delivered was checked by the progressive loss of weight. The time required was noted.

RESULTS

Object 1.—With the jet sprayer, 50 pounds of liquid sulphur dioxide were delivered in the first 4 minutes of operation, 50 additional pounds in the next 5 minutes, and 45 additional pounds in the suc-

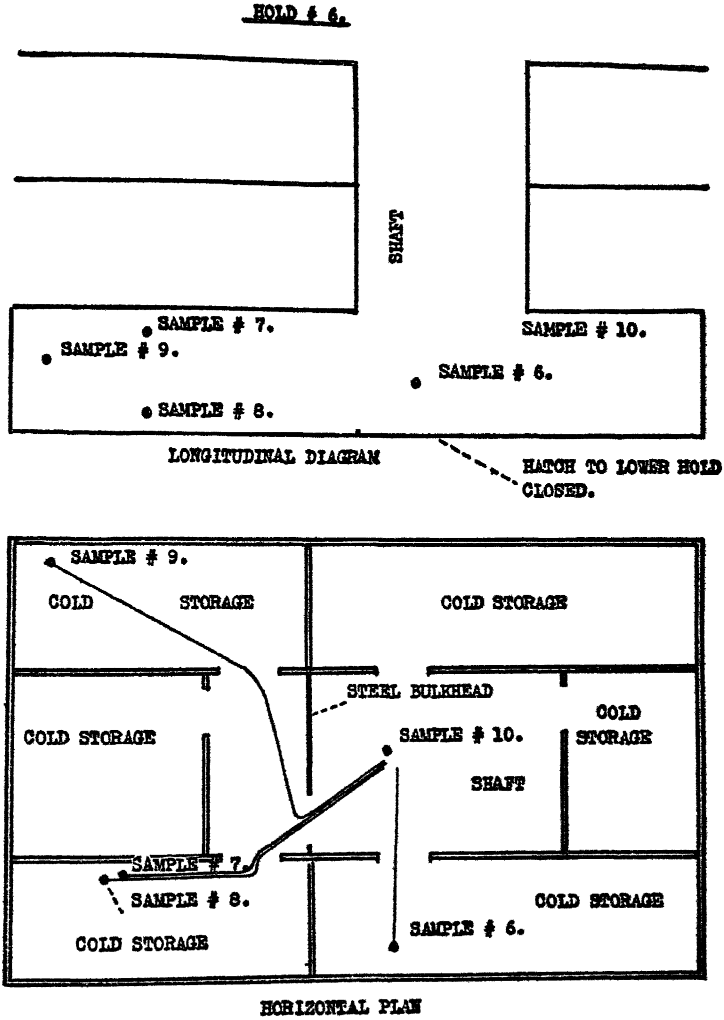

FIGURE 8.—Longitudinal diagram and horizontal plan of hold no. 6, showing locations from which air samples were drawn.

ceeding 6 minutes—a total of 145 pounds in 15 minutes. At this point, loss of weight ceased, showing that the tank was empty. After permitting the pressure to blow off, the delivery tube was disconnected and was placed on a second full cylinder. The jet sprayer

was replaced by the disk sprayer Air pressure of 150 pounds had been let into the cylinder prior to connecting the delivery tube. When all was ready, the valve was opened and 25 pounds of liquid sulphur dioxide were sprayed into the hold in 3 minutes, when the valve was closed

The total time for delivering 170 pounds of liquid sulphur dioxide into this hold was 28 minutes Since the capacity of the hold was 41,000 cubic feet, this was over 4 pounds per 1,000 cubic feet and should, theoretically, have produced a concentration of 2 27 percent by volume

The cylinder with the disk spray attached was removed to hold no 6, where it was set up in the same manner as before The valve was opened, and the remaining amount of liquid was sprayed in.

The time intervals and amounts delivered were as follows: In 2 minutes after starting, 20 pounds had been introduced; in the next 2 minutes, 20 additional pounds; in the third 2 minutes, 20 additional pounds, in the fourth 2 minutes, 20 additional pounds; in the ensuing 4 minutes, 43 additional pounds The entire 123 pounds were delivered in just 12 minutes from the time the valve was opened.

In hold no 6, there was introduced an additional amount of 31 pounds of liquid sulphur dioxide in a manner that will be explained later. This makes a total of 154 pounds in this hold, the capacity of which was 32,000 cubic feet—a theoretical concentration of 2 63 percent by volume

At no time was there any material slowing of the rate of delivery with either of these sprayers There was apparently no tendency for either sprayer to freeze, although both were found frosted over the surface when taken from the hold.

Summarizing, it will be noted that, using cylinders containing 150 pounds of liquid sulphur dioxide under an initial pressure of 150 pounds per square inch and with the types of sprayers used, the liquid was sprayed out at the rate of about 10 pounds per minute The spraying apparatus was changed from one cylinder to another in 10 minutes The essential point in manipulation, of course, was that the cylinders were inclined so that the delivery valve was at the bottom, and the air and vapor under pressure at the top. This accomplished two objects· One was rapid ejection of the sulphur dioxide as a liquid; the other was prevention of evaporation of any considerable amount until after the liquid had been projected from the sprayer, thereby preventing excessive cooling of the apparatus.

At a later date a full cylinder was set on a cradle, valve down, the disk sprayer attached and the valve opened. No air pressure was added. Progressive loss of weight was not noted, but the time of opening the valve and the moment when the spray ceased were

taken, giving the total time required to empty the cylinder. This was 18 minutes The cylinder was weighed before and after the test, the loss of weight being 149 pounds Atmospheric temperature during the period of this test was 58° F.

While the time required to empty the cylinder under its own pressure was a few minutes longer than under 150 pounds air pressure, the time required to introduce air pressure was eliminated along with the labor, inconvenience, and apparatus necessarily incident to such an operation

By way of comment, two improvements are suggested One is the use of smaller containers; the other, the use of additional delivery tubes and spray nozzles so that two, three, or more cylinders may be emptied at the same time As to the size of cylinders, those containing not more than 50 pounds liquid sulphur dioxide would be very much more convenient than the cylinders used The total weight of one of the latter was close to 300 pounds.

Object 2.—In hold no 1, object 2 (which was to ascertain varying concentration at different levels) was determined by comparison of concentrations in samples 1, 2, and 3, at levels of 6 feet, 20 feet, and 46 feet, respectively, below the hatch coaming, and, consequently, in reverse at levels of 4 feet, 30 feet, and 44 feet above the level of the ballast in the lower hold. The results of tests of these samples at periods of 1 hour, 3½ hours, and 5½ hours after introducing the gas are given in table 1. Briefly, they show very much the same concentration at different levels, unexpectedly a trifle lower at the deeper levels.

TABLE 1 —*Comparative concentration of SO_2 at different levels in hold no 1*

[Calculated concentration (basis of amount of SO_2 introduced), 2 27 percent by volume]

Number and location of sample	Concentration, percent by volume		
	After 1 hour	After 3½ hours	After 5½ hours
No 1, 6 feet below hatch, 44 feet from top of ballast	1 09	0 67	0 51
No 2, 20 feet below hatch, 30 feet from top of ballast	1 08	63	.50
No 3, 46 feet below hatch, 4 feet from top of ballast	1 04	61	.45

In hold no. 6, samples were taken 1 hour after the gas had been introduced. The results are presented in table 2, and show about the same concentration in the various cold-storage compartments, and a somewhat lower concentration in the hatchway. In one compartment where samples were taken at different levels, concentration was decidedly higher near the floor than near the top.

TABLE 2.—*Concentrations of SO_2 in various compartments on same level*

[Samples taken 1 hour after introduction of gas Calculated concentration, 2 63 percent by volume

Number and location of sample	Concentration, percent by volume
No 6 cold-storage space on port side	1 86
No 7, cold-storage space, port side, forward, near top	1 32
No 8, same as no 7, but near floor	2 19
No 9, cold-storage space on starboard side	1 94
No 10, in hold 25 feet below hatch	1 03

It will be noted that the concentration shown in hold no 1 one hour after introduction of the gas was only about one half of that calculated on the basis of the amount of gas introduced In the succeeding 4½ hours it was progressively reduced an additional 25 percent Since very little leakage was noted, it is believed that most of this reduction was due to absorption on the surfaces of the hold, particularly in the lower hold, where both steel and wood surfaces were distinctly moist.

In hold no 6 the concentrations found more nearly approached the calculated figure. It is believed this is largely accounted for by the fact that the lower hold, containing most of the moist surfaces, was blocked off. The compartments actually fumigated were at a warmer level above the water line

Object 3.—The purpose here, to determine the amount of gas penetrating into enclosed spaces, was accomplished, in hold no 1, through samples 4 and 5 in the partially closed well passing through the ballast in the bottom of the hold, and in the pipe casing on the second 'tween deck. The results of these tests appear in table 3, where it is shown that the amount of gas was at each period (with one exception) less than half of that in the hold. The more rapid disappearance of gas in sample 4 is presumably explained by the presence of a pool of water at the bottom of the well from which it was taken. It will be noted that in both these locations, for a period of at least 3½ hours the concentration was higher than that which had previously been determined, in experiments at this station, as necessary to kill rats in 1 to 2 hours, that is 0.2 percent.

TABLE 3.—*Concentrations of SO_2 in two enclosed spaces in hold no 1*

Location of sample	Concentration, percent by volume		
	After 1 hour	After 3¼ hours	After 5¼ hours
No. 2 (from table 1; control) in hold 20 feet below hatch, 30 feet from top of ballast	1.08	0.63	0 50
No. 4, near bottom of well, 8 feet deep, through ballast in bottom of lower hold	.45	21	.09
No. 5, in casing on second 'tween-deck, 28 feet below hatch, 22 feet from top of ballast	.48	.54	.21

Object 4.—The purpose here was to determine the rate of delivery of the gas when allowed to vaporize in the cylinder. A cylinder containing approximately 150 pounds of liquid sulphur dioxide was placed upright on platform scales, and the pressure of the vapor in the top of the cylinder was determined to be almost exactly 50 pounds. A 20-foot length of rubber tubing was then connected to the outlet, passed into hold no. 6, and the valve opened wide. During the first 6 minutes, 4 pounds were delivered; during the next 6 minutes, an additional 4 pounds were delivered, during the following 16 minutes, an additional 5 pounds were delivered; and during the ensuing 30 minutes, an additional 5 pounds were delivered. The valve on the cylinder was then closed and the cylinder was allowed to stand for 30 minutes The valve was then again opened During the following 30 minutes, 10 pounds were delivered; in the next 12 minutes, 2 pounds additional were delivered; in the ensuing 8 minutes, 1 pound more was delivered.

At the end of the first period of observation the liquid remaining in the cylinder had become so chilled that the surface of the cylinder was frosted to the height of the liquid inside This frost disappeared during the half-hour interval, but had reappeared at the end of the second period of observation (fig. 6).

It is quite obvious from this test that once the gas already vaporized in the cylinder was blown off, the ensuing delivery of vaporized SO_2 was dependent upon the heat intake. During the period of this experiment, the atmospheric temperature rose from 50° to 55° F. Furthermore, the cylinder, which was painted black, was directly in the sunlight.

It is roughly calculated from the data given—that is, the delivery of a total of 31 pounds of gas in approximately 2 hours' total elapsed time—that it would require some 10 hours to deliver 150 pounds from a single cylinder. While it is obvious that the amount of gas delivered in a given period of time can be increased by using several cylinders, it is equally obvious that unless the amount of gas in each individual cylinder is quite small, a very extended time must be allowed for introducing gas by this method.

This test was repeated a few days later, when a cylinder containing 120 pounds of liquid SO_2 was set upright on platform scales on the open dock and the valve opened wide. During the first half hour it lost in weight 23 pounds. During the next hour it lost 8 pounds. During the following hour it lost 6 pounds. During the following 3 hours it lost 11 pounds, and thereafter 3½ pounds an hour on the average day and night until a constant weight was reached more than 30 hours after beginning the test. The progressive lowering of the level of the liquid inside the cylinder could be followed by observing the slow lowering of the frost covering on the outside. Atmospheric

temperature varied during the test from 42° to 58° F. The weather was clear. During the period of this test, 22 hours after the start, the cylinder was moved a distance of 500 feet The consequent agitation caused a loss in the ensuing hour of 12½ pounds.

The results of these experiments are of extreme interest in view of the use of liquid sulphur dioxide introduced by such a method at some seaports. It would appear that its use in this manner in the past may have been largely empirical and not controlled by exact measurements. One would not expect that the results obtained were of the highest order.

FREEZING OF SPRAYERS

Because there have been reports of sprayers for liquid sulphur dioxide freezing during the introduction of the fumigant, so that the gas could not be passed through until they had been thawed, an experiment was conducted with liquid sulphur dioxide to which approximately 5 percent of water was added. When attempts were made to spray this through the disk type nozzle, a sufficient amount of the water froze in the narrow outlet to completely block the sprayer. This occurred when only some 5 or 6 pounds had been delivered. It would appear from this that freezing of the sprayers occurs when there is an appreciable amount of water in the fumigant.

COURT DECISION RELATING TO PUBLIC HEALTH [1]

City ordinance, making vaccination a prerequisite to admission to a public school, upheld.—(Mississippi Supreme Court; *Hartman* v. *May et al.*) An ordinance of the city of Biloxi made it unlawful for any child of educable age to attend any school in the city to which the public generally was admitted unless the child, previous to the date of his or her application for admission, had presented to the superintendent, principal, or teacher in charge of such school a certificate from the city health officer or some other reputable physician of the city showing that the child had been successfully vaccinated against smallpox or was immune to the danger of contracting the disease. A resolution on the subject, adopted by the board of trustees of the city schools, was in accord with the requirements of the ordinance. The governing authorities of municipalities were empowered by section 2396 of the Code of 1930 "to make regulations to secure the general health of the municipality" and by section 2417 "to make regulations to prevent the introduction and spread of contagious or infectious diseases" and "to make quarantine laws for that purpose".

An injunction was sought to restrain the defendants, the superintendent and board of trustees of the city schools, from refusing to

[1] This abstract was prepared from a mimeographed copy of the decision furnished to the Public Health Service by the Mississippi State Board of Health.

permit the appellant, an 8-year old child, to enter school The bill of complaint alleged that the child was excluded from school because he had not been vaccinated, that there was no epidemic of smallpox in the city, that the said child had not been exposed to smallpox or other communicable disease, and that he had violated none of the valid school rules. A demurrer to the bill of complaint was sustained by the lower court, and an appeal was taken to the supreme court.

On appeal it was contended that, in the absence of an express statutory requirement of vaccination against smallpox as a prerequisite to a child's right to enter the public schools, a municipality had no power to require vaccination as a condition precedent to the right to attend its schools, or, in other words, that the general statutory grant of authority to municipalities to make regulations to prevent the introduction and spread of contagious or infectious diseases did not empower municipal authorities to exclude children from the public schools because of failure or refusal to be vaccinated. The further contention was made that, in the absence of an epidemic of smallpox in the city, the vaccination ordinance was arbitrary and unreasonable and, therefore, void. After detailing the statutory provisions quoted above, the supreme court went on to say:

> * * * The medical profession generally recognize vaccination as an effective means of prevention of the disease [smallpox], and we do not think that the ordinance, requiring children to be vaccinated as a condition to their admission to a public school, is an arbitrary and unreasonable exercise of the power "to make regulations to prevent the introduction and spread of contagious or infectious diseases." The power granted is not only to make regulations to prevent the "spread" of such diseases but to prevent the "introduction" thereof. The argument of counsel that the unreasonableness and invalidity of the ordinance is emphasized by the fact that there was no case of smallpox in the municipality or surrounding territory and no threatened outbreak of the disease is not supported by the averments of the bill of complaint. The bill merely charged that there was at the time no epidemic of smallpox in the said city
>
> In the exercise of the power and authority granted to make regulations to secure the general health and prevent the introduction and spread of contagious or infectious diseases much must be left to the judgment and discretion of the municipal authorities, and the presumption is in favor of the reasonableness and propriety of regulations enacted in pursuance of such grant of power. The ordinance here in question was intended and reasonably calculated to prevent the introduction or spread of contagion and bears a direct and intimate relation to the maintenance of the health of the inhabitants of the municipality, and we are unable to say that, in the enactment thereof, there was an unreasonable or arbitrary exercise of power. * * *
>
> While there is authority in other jurisdictions for the view that a general legislative delegation of power to make regulations for the preservation of the public health does not confer on municipal or school authorities the power to require children to be vaccinated as a condition to their admission to a public school, there is also ample authority supporting the views herein expressed. * * *

The appellant also contended that, in view of a constitutional provision requiring the legislature to establish "a uniform system of free

public schools by taxation or otherwise for all children between the ages of 5 and 21 years" and of a statutory provision making school attendance compulsory, the municipal and school authorities of the city had no power to refuse him admission to school because of his refusal or failure to submit to vaccination. Concerning this the court said.

* * * The same contention and argument was presented in the case of *McLeod* v. *State, supra*, and, while the validity of health regulations was not there presented, the principle involved was the same, and the language of the court in disposing of the point is applicable and controlling here In that case it was held that " Section 201 of the constitution does not deprive the legislature of the power to pass laws authorizing trustees of public schools to make reasonable rules and regulations for the government and conduct of such schools " In passing upon the apparent conflict between regulations excluding certain classes of minors from the public schools and the compulsory education provisions of the school code, the court there held that the compulsory education provision of the school code and other provisions of the code authorizing reasonable regulations for the management, conduct, and control of schools should be construed together, the court saying " So construed, they do not mean that a child is entitled to attend a public school regardless of his conduct, but on the contrary that it is subject to such reasonable rules for the government of the school as the trustees thereof may see fit to adopt "

The court concluded its opinion as follows·

* * * It having been determined in the case at bar that the ordinance requiring vaccination as a condition to admission to the public schools was a reasonable and valid exercise of the power granted to the municipality to make regulations to prevent the introduction and spread of contagious or infectious diseases, it follows that the appellant was not entitled to admission to the schools in violation of the provisions of the ordinance.

DEATHS DURING WEEK ENDED JAN. 20, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Jan 20, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	8,859	9,224
Deaths per 1,000 population, annual basis	12 3	12 9
Deaths under 1 year of age	573	705
Deaths under 1 year of age per 1,000 estimated live births	53	[1] 60
Deaths per 1,000 population, annual basis, first 3 weeks of year	12 7	13 3
Data from industrial insurance companies		
Policies in force	67,487,068	69,051,695
Number of death claims	16,515	17,168
Death claims per 1,000 policies in force, annual rate	12.8	13 0
Death claims per 1,000 policies, first 3 weeks of year, annual rate	10 9	11 5

[1] Data for 81 cities

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Jan. 27, 1934, and Jan. 28, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan 27, 1934, and Jan 28, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan 27, 1934	Week ended Jan. 28, 1933	Week ended Jan 27, 1934	Week ended Jan 28, 1933	Week ended Jan 27, 1934	Week ended Jan 28, 1933	Week ended Jan 27, 1934	Week ended Jan 28, 1933
New England States.								
Maine	2	1	2	700	1	1	0	0
New Hampshire			1	1	67		0	0
Vermont		1			35		0	0
Massachusetts	18	30		111	1,521	130	0	3
Rhode Island	3	5	1	71	2	1	0	0
Connecticut	6	6	40	270	14	67	1	0
Middle Atlantic States								
New York	59	71	[1] 25	[1] 138	629	1,550	1	1
New Jersey	25	31	30	230	135	413	1	1
Pennsylvania	81	121			1,667	564	3	2
East North Central States								
Ohio	44	61	8	375	263	784	0	2
Indiana	36	50	55	107	220	6	4	3
Illinois	38	63	56	158	214	147	11	21
Michigan	11	28	1	64	47	492	2	2
Wisconsin	13	4	46	1,522	299	164	0	2
West North Central States								
Minnesota	7	8	3	2	137	610	1	0
Iowa [2]	7	10	18		80		0	1
Missouri	63	40	39	21	785	154	1	2
North Dakota	5		3	655	166	112	1	1
South Dakota		5		17	317	11	0	0
Nebraska	11	12		132	78	9	0	1
Kansas	13	24	6	350	61	104	0	2
South Atlantic States								
Delaware	5	2		14	87		0	0
Maryland [2]	7	8	33	434	48	1	1	7
District of Columbia	11	6	5	5	156	2	0	1
Virginia	26	28			570	329	2	1
West Virginia	19	14	63	253	27	333	0	1
North Carolina	41	21	109	827	2,423	334	1	1
South Carolina	13	10	744	3,092	336	35	0	0
Georgia [3]	19	7	134	676	1,271	1	1	0
Florida	15	7		183	43	18	1	0

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan 27, 1934, and Jan. 28, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Jan 27, 1934	Week ended Jan 28, 1933	Week ended Jan 27, 1934	Week ended Jan 28, 1933	Week ended Jan 27, 1394	Week ended Jan 28, 1933	Week ended Jan 27, 1934	Week ended Jan 28, 1933
East South Central States								
Kentucky	18	22	7	395	68	17	0	2
Tennessee	16	15	141	467	772	6	3	6
Alabama [3]	42	15	161	312	240	5	1	2
Mississippi	9	1	---	---	---	---	0	0
West South Central States								
Arkansas	7	7	25	645	461	8	1	1
Louisiana	26	16	20	124	41	24	0	0
Oklahoma [4]	34	29	89	554	580	---	2	1
Texas [3]	179	107	234	448	711	73	5	1
Mountain States								
Montana	2	1	4	832	11	152	0	0
Idaho	---	7	1	1	45	9	0	0
Wyoming	1	---	---	---	79	17	0	0
Colorado	5	3	10	65	14	2	0	1
New Mexico	7	7	---	3	133	8	0	1
Arizona	3	12	15	22	11	1	2	0
Utah [2]	---	6	---	2	777	2	0	0
Pacific States								
Washington	---	14	---	6	425	2	0	0
Oregon	1	5	40	243	35	34	0	1
California	32	46	32	312	763	233	3	5
Total	980	987	2,201	14,839	16,895	6,965	49	76

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan 27, 1934	Week ended Jan 28, 1933	Week ended Jan 27, 1934	Week ended Jan 28, 1933	Week ended Jan 27, 1934	Week ended Jan 28, 1933	Week ended Jan 27, 1934	Week ended Jan 28, 1933
New England States								
Maine	0	4	19	24	0	0	0	0
New Hampshire	0	0	26	51	0	0	0	0
Vermont	0	0	10	16	0	0	2	0
Massachusetts	1	0	265	378	0	0	0	5
Rhode Island	0	0	17	34	0	0	1	0
Connecticut	1	0	53	117	0	2	1	1
Middle Atlantic States								
New York	2	3	715	823	0	0	5	8
New Jersey	0	0	201	307	0	0	8	3
Pennsylvania	1	0	775	961	0	0	15	2
East North Central States.								
Ohio	1	0	461	689	0	1	5	12
Indiana	0	1	181	129	3	5	0	5
Illinois	1	1	552	523	1	17	7	3
Michigan	0	0	463	476	0	0	4	2
Wisconsin	1	0	206	172	31	7	0	3
West North Central States								
Minnesota	1	0	63	82	3	0	6	2
Iowa [2]	0	0	102	36	4	31	2	4
Missouri	0	0	144	88	17	0	2	1
North Dakota	0	5	39	11	0	1	0	0
South Dakota	1	0	29	19	1	4	0	11
Nebraska	1	0	32	38	1	39	1	1
Kansas	0	1	156	64	1	0	4	0
South Atlantic States:								
Delaware	0	0	13	10	0	0	0	1
Maryland [2]	0	0	98	81	0	0	2	1
District of Columbia	0	0	18	23	0	0	0	1
Virginia	0	2	99	55	1	0	13	14
West Virginia	0	0	79	41	0	0	7	5
North Carolina	2	0	89	40	1	2	2	4
South Carolina	0	0	17	3	1	4	4	6
Georgia [2]	0	0	16	16	5	1	6	6
Florida	0	0	9	8	0	0	3	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Jan 27, 1934, and Jan 28, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Jan 27, 1934	Week ended Jan 28, 1933	Week ended Jan 27, 1934	Week ended Jan 28, 1933	Week ended Jan 27, 1934	Week ended Jan 28, 1933	Week ended Jan 27, 1934	Week ended Jan 28, 1933
East South Central States								
Kentucky	1	1	74	54	0	0	3	0
Tennessee	1	1	55	51	0	0	9	2
Alabama [3]	1	2	24	28	0	0	11	0
Mississippi	0	0	18	16	0	2	3	3
West South Central States								
Arkansas	0	1	15	27	22	13	0	8
Louisiana	0	2	37	7	3	8	7	8
Oklahoma [4]	0	1	23	27	2	17	2	5
Texas [3]	0	0	104	68	14	32	11	8
Mountain States								
Montana	0	0	25	7	0	0	2	1
Idaho	0	0	4	3	7	15	0	0
Wyoming	0	0	7	8	0	0	0	0
Colorado	0	0	38	25	1	0	0	0
New Mexico	0	0	71	12	0	0	13	1
Arizona	1	5	17	10	1	0	0	0
Utah [2]	0	0	13	9	0	0	0	0
Pacific States								
Washington	2	0	52	32	4	15	2	5
Oregon	0	0	56	17	5	6	1	4
California	4	3	292	204	11	23	7	9
Total	23	33	5,872	5,920	140	245	171	157

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended Jan 27, 1934, 23 cases, as follows Georgia, 13, Alabama, 6, Texas, 4.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
November 1933										
Colorado	1	31			12		1	139	60	23
Massachusetts	4	98		4	1,085		6	694	0	4
Wisconsin	6	65	135		372		12	469	130	20
December 1933										
California	11	144	177	2	1,223	3	19	859	34	154
Colorado		50			27		0	109	29	22
Georgia	3	134	565	147	1,683	14	5	105	1	44
Indiana	7	292	187		248		3	870	15	13
Massachusetts	4	94		2	2,251		4	843	0	14
Mississippi		68	3,367	2,680	1,284	170	1	114	9	7
Montana	3	13	90		6		0	42	20	12
Nevada		1	10				0	5	4	0
New Mexico	3	38	5	[1] 23	269	1	1	117	0	33
New York [2]	18	218		9	2,245		26	1,953	0	38
Oklahoma [3]	13	271	318	37	284	6		188	1	29
Oregon		18	75		87		4	187	37	13
Puerto Rico		59	263	6,036	188		0	1	0	49
Virginia	8	324	390	8	439	8	1	605	0	55
Washington	4	23	88		940		10	145	17	14
Wisconsin	7	49	117		653		5	428	153	3

[1] 8 carriers included.
[2] The report for New York for December published herein is a correction of an erroneous report published in Public Health Reports of Jan 20, 1934, pp 122 and 123.
[3] Exclusive of Oklahoma City and Tulsa.

November 1933

	Cases
Chicken pox	
Colorado	426
Massachusetts	772
Wisconsin	2,299
Dysentery	
Colorado	4
Massachusetts	12
German measles	
Massachusetts	28
Wisconsin	29
Impetigo contagiosa	
Colorado	25
Lead poisoning	
Massachusetts	4
Lethargic encephalitis	
Massachusetts	3
Wisconsin	2
Mumps	
Colorado	48
Massachusetts	253
Wisconsin	61
Ophthalmia neonatorum	
Massachusetts	36
Paratyphoid fever	
Colorado	1
Septic sore throat	
Massachusetts	20
Trachoma	
Massachusetts	1
Wisconsin	1
Trichinosis	
Massachusetts	4
Tularaemia	
Wisconsin	12
Undulant fever	
Colorado	1
Massachusetts	2
Wisconsin	9
Vincent's infection	
Colorado	3
Whooping cough	
Colorado	226
Massachusetts	1,308
Wisconsin	1,493

December 1933

	Cases
Actinomycosis	
California	1
Anthrax	
Massachusetts	2
New York	1
Beriberi	
California	1
Chicken pox	
California	1,599
Colorado	475
Georgia	86
Indiana	741
Massachusetts	1,028
Mississippi	593
Montana	322
Nevada	25
New Mexico	83
New York	3,405
Oklahoma [3]	96
Oregon	251
Puerto Rico	31
Virginia	400
Washington	511
Wisconsin	1,913
Conjunctivitis	
Georgia	1
Dengue	
Georgia	1
Mississippi	2
Diarrhea and dysentery	
Virginia	44
Dysentery	
California (amoebic)	39
California (bacillary)	47
Colorado	4
Georgia (amoebic)	7
Georgia (bacillary)	6
Massachusetts	9
Mississippi (amoebic)	92

December 1933—Continued

	Cases
Dysentery—Continued	
Montana (amoebic)	2
Nevada	1
New Mexico	2
New York (amoebic)	49
New York (bacillary)	21
Oklahoma [3]	5
Oregon	2
Puerto Rico	171
Virginia (amoebic)	6
Washington	10
Washington (amoebic)	2
Filariasis	
Puerto Rico	7
Food poisoning	
California	203
German measles	
California	41
Massachusetts	30
Montana	2
New Mexico	5
New York	42
Washington	11
Granuloma, coccidioidal	
California	5
Hookworm disease	
California	1
Georgia	119
Mississippi	224
Impetigo contagiosa	
Colorado	14
Oregon	50
Jaundice—epidemic	
California	1
Lead poisoning	
Colorado	2
Massachusetts	2
Leprosy	
Puerto Rico	1
Lethargic encephalitis	
California	3
Indiana	2
Massachusetts	1
New York	3
Oregon	2
Virginia	3
Washington	3
Wisconsin	1
Mumps	
California	1,164
Colorado	66
Georgia	55
Indiana	38
Massachusetts	367
Mississippi	115
Montana	1
New Mexico	75
Oklahoma [3]	17
Oregon	4
Puerto Rico	43
Virginia	104
Washington	294
Wisconsin	71
Ophthalmia neonatorum	
California	3
Massachusetts	65
New York	3
Puerto Rico	3
Paratyphoid fever	
California	4
Georgia	2
New York	2
Virginia	4
Psittacosis	
California	1
Puerperal septicemia	
Mississippi	22
New Mexico	1
Puerto Rico	2
Washington	1
Rabies in animals	
California	61
Indiana	27
Mississippi	3
New York [4]	1

December 1933—Continued

	Cases
Rabies in animals—Con.	
Oregon	1
Washington	13
Rabies in man.	
Oklahoma [3]	1
Rocky Mountain spotted fever	
Montana	1
Scabies	
Montana	8
Oklahoma [3]	1
Oregon	23
Septic sore throat	
California	8
Georgia	35
Massachusetts	15
Montana	2
New Mexico	1
New York	30
Oklahoma [3]	31
Oregon	7
Virginia	48
Washington	4
Tetanus	
California	9
Georgia	1
Massachusetts	1
New York	3
Oklahoma [3]	1
Puerto Rico	14
Tetanus, infantile	
Puerto Rico	4
Trachoma	
California	13
Massachusetts	2
Mississippi	5
Oklahoma [3]	4
Puerto Rico	27
Trichinosis	
California	2
Massachusetts	1
New York	16
Tularaemia	
Georgia	5
Virginia	28
Wisconsin	3
Typhus fever	
Georgia	69
Massachusetts	1
New York	1
Undulant fever	
California	12
Georgia	3
Massachusetts	1
Mississippi	2
New York	22
Oklahoma [3]	2
Oregon	2
Virginia	1
Wisconsin	4
Vincent's infection	
Montana	3
New York [4]	79
Oklahoma [3]	2
Oregon	7
Whooping cough	
California	928
Colorado	194
Georgia	154
Indiana	199
Massachusetts	1,144
Mississippi	1,039
Montana	130
Nevada	2
New Mexico	120
New York	1,577
Oklahoma [3]	40
Oregon	74
Puerto Rico	380
Virginia	276
Washington	302
Wisconsin	909
Yaws.	
Puerto Rico	1

[3] Exclusive of Oklahoma City and Tulsa.

[4] Exclusive of New York City

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan 20, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Maine:											
Portland	0	------	0	1	5	1	0	0	0	10	27
New Hampshire											
Concord	0	------	0	2	3	4	0	0	0	0	13
Manchester	0	------	0	0	4	0	0	1	0	0	25
Nashua	0	------	0	0	0	6	0	0	0	0	------
Vermont											
Barre	0	------	0	5	0	0	0	0	0	0	3
Burlington	0	------	0	0	0	2	0	0	1	0	15
Massachusetts											
Boston	1	------	0	344	29	73	0	10	1	80	247
Fall River	2	------	0	0	3	0	0	0	0	0	34
Springfield	0	------	0	0	3	3	0	0	0	21	35
Worcester	0	------	0	190	7	7	0	3	0	9	51
Rhode Island											
Pawtucket	0	------	0	0	0	0	0	0	0	0	20
Providence	1	1	0	1	11	14	0	3	0	16	69
Connecticut											
Bridgeport	0	------	0	4	4	25	0	1	0	1	32
Hartford	0	------	0	0	6	12	0	1	0	3	55
New Haven	0	------	0	0	8	2	0	0	0	10	57
New York											
Buffalo	2	1	1	190	14	27	0	6	0	15	138
New York	39	22	11	32	167	207	0	69	2	117	1,520
Rochester	0	------	0	2	2	15	0	0	0	9	62
Syracuse	0	------	0	0	7	9	0	2	0	60	64
New Jersey											
Camden	1	------	0	12	5	8	0	1	0	0	42
Newark	0	2	2	1	10	16	0	2	1	26	98
Trenton	0	------	0	3	7	17	0	3	0	4	44
Pennsylvania											
Philadelphia	4	10	7	669	44	84	0	27	1	53	548
Pittsburgh	6	9	6	18	26	33	0	5	1	62	163
Reading	0	------	0	13	4	4	0	1	0	7	30
Scranton	1	------	0	0	0	7	0	0	0	7	------
Ohio:											
Cincinnati	3	2	0	375	12	21	0	5	0	8	139
Cleveland	9	52	4	2	21	64	0	10	0	74	186
Columbus	12	------	0	3	13	32	0	9	0	10	94
Toledo	2	3	1	63	5	38	0	3	0	36	63
Indiana											
Fort Wayne	9	------	0	1	2	9	0	1	1	0	30
Indianapolis	2	------	0	65	20	20	0	1	0	13	------
South Bend	0	------	0	0	3	10	0	0	0	0	24
Terre Haute	0	------	0	54	3	6	0	0	0	1	18
Illinois											
Chicago	0	9	1	15	72	209	0	34	2	153	722
Springfield	1	1	0	0	7	7	0	0	0	15	28
Michigan											
Detroit	3	1	4	7	30	97	0	14	0	69	256
Flint	2	------	2	7	7	60	0	0	0	6	33
Grand Rapids	0	------	2	1	3	11	0	1	0	0	29
Wisconsin:											
Kenosha	0	------	0	0	0	41	0	0	0	6	7
Madison	0	------	------	3	------	3	0	2	0	17	23
Milwaukee	0	3	3	1	6	39	0	2	0	77	102
Racine	1	------	0	3	0	21	0	0	0	5	14
Superior	0	------	0	1	3	2	0	0	0	0	11
Minnesota											
Duluth	0	------	0	0	3	2	0	1	0	0	24
Minneapolis	1	------	2	1	13	26	0	2	0	20	125
St. Paul	0	1	1	1	16	7	0	3	2	4	81
Iowa:											
Des Moines	3	------	------	0	------	21	0	------	0	0	39
Sioux City	1	------	------	2	------	2	0	------	0	0	------
Waterloo	0	------	------	0	------	1	0	------	0	4	------
Missouri.											
Kansas City	3	------	1	4	18	18	0	11	1	1	114
St. Joseph	5	------	0	1	15	5	0	1	0	0	47
St. Louis	29	1	------	504	16	25	1	9	2	54	295

City reports for week ended Jan 20, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Dakota											
Fargo	0	------	0	122	0	0	0	0	0	3	6
Grand Forks	0	------	0	0	0	0	0	0	0	0	--------
South Dakota.											
Aberdeen	0	------	0	0	0	0	0	0	0	0	--------
Sioux Falls	0	------	0	72	0	0	0	0	0	0	6
Nebraska											
Omaha	0	------	0	39	5	0	0	1	0	17	63
Kansas											
Topeka	0	------	2	0	2	8	0	0	0	8	16
Wichita	2	------	0	1	2	5	0	1	0	12	21
Delaware											
Wilmington	0	------	0	14	9	4	0	1	0	0	41
Maryland											
Baltimore	2	13	2	13	23	37	0	13	1	103	223
Cumberland	1	------	0	0	0	2	0	0	0	7	15
Frederick	0	------	0	0	0	2	0	0	0	0	4
District of Columbia											
Washington	20	3	2	137	29	18	0	13	0	28	202
Virginia											
Lynchburg	2	------	1	0	1	3	0	0	0	1	9
Norfolk	0	------	0	42	10	11	0	8	1	0	46
Richmond	2	------	1	3	3	11	0	1	0	2	62
Roanoke	1	------	0	1	5	4	0	1	0	0	20
West Virginia											
Charleston	2	2	0	0	1	5	0	1	0	0	12
Huntington	0	------	0	0	0	13	0	0	0	0	--------
Wheeling	0	------	0	0	2	9	0	0	0	2	22
North Carolina											
Raleigh	0	------	0	14	1	1	0	0	0	11	12
Wilmington	0	1	0	0	2	0	0	1	0	3	13
Winston-Salem	2	------	0	273	7	3	0	1	0	0	25
South Carolina											
Charleston	0	37	0	0	6	2	0	1	0	0	30
Columbia	0	------	0	0	0	0	0	0	0	0	3
Greenville	1	------	0	2	1	0	0	0	0	1	2
Georgia:											
Atlanta	12	40	2	63	14	4	0	7	0	4	83
Brunswick	0	1	1	27	0	0	0	0	0	0	2
Savannah	5	4	0	19	2	5	0	0	0	0	33
Florida											
Miami	1	------	0	0	1	0	0	2	1	4	30
Tampa	4	------	0	3	2	1	0	3	0	2	21
Kentucky											
Ashland	0	------	--------	0	-------	1	0	-------	0	5	--------
Louisville	1	------	0	0	8	19	0	1	0	7	79
Tennessee:											
Memphis	0	------	0	111	6	6	0	6	0	10	79
Nashville	0	------	1	51	1	8	0	2	0	12	50
Alabama											
Birmingham	4	6	0	2	0	10	1	0	0	1	53
Mobile	0	------	0	0	0	1	0	1	0	1	27
Montgomery	0	------	--------	0	-------	1	0	-------	0	4	--------
Arkansas											
Fort Smith	0	------	--------	40	-------	2	0	-------	0	0	--------
Little Rock	2	------	0	59	1	1	0	2	0	4	3
Louisiana:											
New Orleans	20	3	4	5	12	0	0	15	2	0	177
Shreveport	1	------	0	0	3	4	0	0	0	0	33
Texas											
Dallas	10	1	1	0	16	6	2	5	1	5	73
Forth Worth	8	------	4	0	9	8	1	1	0	0	41
Galveston	0	------	0	0	1	1	0	2	0	0	14
Houston	10	------	1	0	7	3	2	6	0	0	75
San Antonio	2	------	5	0	11	7	0	5	0	0	57
Montana:											
Billings	0	------	0	0	0	3	0	0	0	0	11
Great Falls	0	------	0	1	1	0	0	0	0	1	10
Helena	0	------	0	1	0	0	0	0	0	0	0
Missoula	0	------	0	0	0	0	0	0	0	0	9
Idaho:											
Boise	0	------	0	0	1	0	0	0	1	0	7
Colorado:											
Denver	2	29	0	0	8	12	0	4	0	63	77
Pueblo	0	------	1	0	0	1	0	0	0	10	10

City reports for week ended Jan 20, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
New Mexico											
Albuquerque	1	------	0	2	0	3	0	1	0	2	13
Utah											
Salt Lake City	0	------	1	626	3	6	2	1	0	31	39
Nevada											
Reno	0	1	0	0	1	0	0	0	0	0	4
Washington											
Seattle	0	------	--------	1	11	19	0	6	0	63	99
Spokane	0	------	--------	406	------	1	0	2	0	5	30
Tacoma	0	------	0	1	5	0	0	1	0	18	41
Oregon											
Portland	1	------	0	7	3	22	0	2	0	5	72
Salem	0	1	0	0	0	0	0	0	1	6	--------
California											
Los Angeles	18	25	0	7	24	106	14	17	1	74	235
Sacramento	1	------	0	1	3	5	0	2	0	0	34
San Francisco	1	1	1	4	9	18	0	6	0	8	186

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts:				Georgia			
Boston	1	0	0	Atlanta	2	0	0
New York				Tennessee			
New York	2	1	0	Memphis	3	2	0
Syracuse	0	1	0	Louisiana			
Pennsylvania:				New Orleans	0	1	0
Pittsburgh	0	1	0	Texas			
Ohio:				Fort Worth	1	2	0
Cleveland	1	0	0	Nevada			
Illinois				Reno	0	0	1
Chicago	5	5	0	California:			
Michigan				Los Angeles	1	0	1
Detroit	0	0	1				

Lethargic encephalitis.—Cases Bridgeport, 2, New York, 1, Philadelphia, 1, Detroit, 1, St. Louis, 1; Memphis, 1, Portland, Oreg , 1.

Pellagra.—Cases Charleston, S C , 1, Savannah, 1, Memphis, 2, Birmingham, 1

Typhus fever.—Cases Savannah, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended December 30, 1933.—During the 2 weeks ended December 30, 1933, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba [1]	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				1	1					2
Chicken pox		4	1	278	383	39	115	41	98	959
Diphtheria		4	6	35	20	29	4			98
Dysentery							1			1
Erysipelas				11	4	3		1	6	25
Influenza		6		12	10	3			114	145
Lethargic encephalitis					1					1
Measles		1		29	19	11	3	3	14	80
Mumps					90	2			60	152
Paratyphoid fever					1					1
Pneumonia		3			18		7		18	46
Poliomyelitis				1	1					2
Scarlet fever	1	17	8	125	317	21	12	6	87	594
Smallpox								1		1
Trachoma						7	1		3	11
Tuberculosis		2	12	80	76		1	2	22	195
Typhoid fever			2	22	8			2		34
Undulant fever					2					2
Whooping cough		14	2	226	94	6	10	8	16	376

[1] *No report was received from Manitoba for week ended Dec 23, 1933.*

CZECHOSLOVAKIA

Communicable diseases—November 1933.—During the month of November 1933 certain communicable diseases were reported in Czechoslovakia as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	4	1	Paratyphoid fever	11	2
Cerebrospinal meningitis	10	4	Poliomyelitis	13	1
Chicken pox	443		Puerperal fever	45	14
Diphtheria	3,585	203	Scarlet fever	3,678	23
Dysentery	24	1	Trachoma	238	
Influenza	71	2	Typhoid fever	501	48
Lethargic encephalitis	2	1	Typhus fever	12	
Malaria	54				

ITALY

Communicable diseases—4 weeks ended August 20, 1933.—During the 4 weeks ended August 20, 1933, cases of certain communicable diseases were reported in Italy as follows:

Disease	July 24-30		July 31-Aug 6		Aug 6-13		Aug 14-20	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	41	33	27	27	28	27	31	28
Cerebrospinal meningitis	5	5	6	6	5	5	6	4
Chicken pox	184	98	122	79	91	66	85	54
Diphtheria and croup	351	203	356	197	355	259	342	202
Dysentery	37	25	31	18	25	20	22	17
Lethargic encephalitis			2	2	1	1	1	1
Measles	976	240	898	234	797	212	659	196
Poliomyelitis	11	11	14	13	15	15	9	9
Scarlet fever	222	109	270	126	241	122	258	118
Typhoid fever	645	359	873	472	1,006	513	1,119	543

VIRGIN ISLANDS

Notifiable diseases—November-December 1933.—During the months of November and December 1933, cases of certain notifiable diseases were reported in the Virgin Islands as follows

Disease	November 1933	December 1933	Disease	November 1933	December 1933
Filariasis	5	7	Pellagra		2
Gonorrhea	2	4	Syphilis	12	11
Hookworm disease		2	Tuberculosis	5	2
Leprosy	1		Typhoid fever		1
Malaria	13	81	Uncinariasis	2	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Jan 26, 1934, pp 128-139 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Feb 23, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

CHOLERA

Philippine Islands—During the week ended January 27, 1934, cholera was reported in the Philippine Islands as follows. Bohol Province—Antequera, 5 cases, 5 deaths; Balilihan, 1 case, 1 death; Calape, 2 cases, 1 death, Carella, 2 cases, 1 death; Clarin, 2 cases, 1 death; Cortes, 1 case, 2 deaths; Inabanga, 8 cases, 5 deaths; Loon, 12 cases, 5 deaths; Maribojoc, 1 case, 2 deaths; Tagbilaran, 4 cases, 2 deaths; Talibon, 13 cases, 5 deaths; Tubigon, 7 cases, 8 deaths. Cebu Province—Argao, 1 case; Carcar, 1 case, 1 death; Sibonga, 2 cases, 2 deaths. Occidental Negros Province—Calatrava, 6 cases, 4 deaths; San Carlos, 4 cases, 4 deaths. Oriental Negros Province—Ayuquitan, 1 case; Bais, 6 cases, 2 deaths; Tanjay, 8 cases, 6 deaths.

YELLOW FEVER

Senegal.—On January 14, 1934, 1 imported case of yellow fever with 1 death was reported in Kaolack, Senegal. On January 22, 1934, 1 imported case of yellow fever was reported in Podor, Senegal.

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 7

FEBRUARY 16 - - 1934

IN THIS ISSUE

Summary of Current Prevalence of Communicable Diseases
The Effect of Flea Passage on Epidemic Typhus Virus
A Study of the Volume Changes of Tumor Cells in Vitro
Deaths in Large Cities During Week Ended January 27
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - Price, 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world, (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution

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CONTENTS

	Page
Current prevalence of communicable diseases in the United States—December 31, 1933–January 27, 1934	221
Effect of flea passage on epidemic typhus virus	224
Volume changes of tumor cells in vitro	225
Court decision relating to public health	240
Deaths during week ended January 27, 1934	
Deaths and death rates for a group of large cities in the United States	241
Death claims reported by insurance companies	241

PREVALENCE OF DISEASE

United States	
Current weekly State reports	
Reports for weeks ended February 3, 1934, and February 4, 1933	242
Summary of monthly reports from States	244
Weekly reports from cities	
City reports for week ended January 27, 1934	245
Foreign and insular	
Canada	
Provinces—Communicable diseases—2 weeks ended January 13, 1934	248
Quebec Province—Communicable diseases—2 weeks ended January 27, 1934	248
Cuba—Habana—Communicable diseases—4 weeks ended January 27, 1934	248
Panama Canal Zone—Communicable diseases—October-December 1933	249
Puerto Rico—Notifiable diseases—4 weeks ended January 27, 1934	249
Yugoslavia—Communicable diseases—December 1933	249
Cholera, plague, smallpox, typhus fever, and yellow fever	
Cholera	250
Smallpox	250

PUBLIC HEALTH REPORTS

VOL. 49 FEBRUARY 16, 1934 NO. 7

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES [1]

December 31, 1933–January 27, 1934

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Influenza —The number of cases of influenza reported for the current period was 8,999, approximately 4,000 more than was reported for the preceding four weeks Compared with recent years the number of cases was about 2,000 in excess of that for the corresponding period in 1932 and 2,000 below that of 1930, in both of which years the incidence of influenza maintained a very satisfactory level during this period. In 1931 this period included a part of a minor influenza epidemic, and 24,685 cases were reported. During this period in 1929 the 1928–29 epidemic reached its maximum with 424,628 cases. The 1932–33 outbreak reached its peak during the month of December 1932; and although the number of cases had dropped about 35,000, the incidence was still very high (122,413 cases) in the month of January 1933.

A comparison of geographic areas shows that the disease has been most prevalent during the current winter in the South Atlantic and South Central areas, but no section of the country has reported more than the normal seasonal prevalence.

Scarlet fever.—The incidence of scarlet fever (21,359 cases) was approximately the same as that for the corresponding period in the last four years. The New England and Middle Atlantic States reported a

[1] From the Office of Statistical Investigations, U S Public Health Service The numbers of States included for the various diseases are as follows Typhoid fever, 48, poliomyelitis, 48; meningococcus meningitis, 48, smallpox, 48, measles, 47, diphtheria, 48; scarlet fever, 48, influenza, 43 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers.

25 percent decrease from last year's figure, while in the North Central areas the incidence was approximately the same as that for last year. The South Atlantic, South Central, and the Mountain and Pacific areas reported the highest incidence of the disease for this period in recent years In each of those areas the current incidence was approximately 1.5 times that for the corresponding period last year.

Meningococcus meningitis—Although the number of cases of meningococcus meningitis increased slightly, as is usual at this season of the year, the disease was still considerably less prevalent than during the same period in recent years. For the current 4-week period the number of cases was 210, which was only about 60 percent of the number reported for the corresponding period in 1933 and 1932—both rather normal years For this period in 1931 and 1930 the numbers of cases were 595 and 942, respectively. All sections of the country share in the favorable situation which now exists.

Measles.—There were 51,498 cases of measles reported for the 4 weeks ended January 27, an increase of approximately 30,000 over the preceding 4-week period All regions contributed to the increase. For the country as a whole the incidence was 2 4 times that for the corresponding period last year, in fact, it was the highest incidence of the disease in this period in the 6 years for which comparable data are available.

The same situation as described for the country as a whole existed in all geographic areas except the East North Central. In that area the number of cases (3,281) was only 65 percent of last year's figure, approximately the same as in 1932, but also considerably below that of the 3 preceding years. The disease was most prevalent in the South Atlantic, South Central, Mountain, and Pacific areas In the South Atlantic and the Mountain and Pacific areas the number of cases reported for the current period was 4.5 times that for last year, while in the South Central the number of current cases was approximately 10 times that for last year.

Smallpox.—The incidence of smallpox continued to decline. For the current 4-week period 498 cases were reported—the lowest number for this period in the 6 years for which data are available. Each geographic area shared in this favorable situation except the East North Central. In that area the number of cases reported (154) was 1.6 times that for this period last year. It was, however, like all other areas, considerably below the incidence in the 5 preceding years. An unusually high incidence of smallpox in Wisconsin during the past few months is responsible for the excess over last year in the East North Central section. For the current period, 127 of the 154 cases reported from that area occurred in Wisconsin. For this period last year Wisconsin reported 16 cases.

Typhoid fever.—For the country as a whole the number of cases (658) of typhoid fever reported for the 4 weeks ended January 27 was about 90 percent of that for the corresponding period last year, 70 percent of the number in 1932, and approximately the same as that in 1931 and 1930 In the South Central and the Mountain and Pacific areas the current incidence was approximately 1 5 times that for the same period last year, and in the New England and Middle Atlantic and the South Atlantic sections it was 1 2 times last year's incidence The East North Central area reported a slight increase, and in the West North Central group the number of cases (43) was only about 15 percent of last year's figure At this time last year North Dakota reported an outbreak of typhoid fever. Out of the 270 cases reported for this period from the entire West North Central group, North Dakota had 251 For the current period three cases were reported from that State

Diphtheria.—The diphtheria incidence was approximately the same as that for the corresponding period last year For the 4 weeks ended January 27 the number of cases was 4,259 While the incidence for the past few months has been practically on a level with last year, it is still considerably below that of preceding years For this period in the years 1932, 1931, and 1930, the numbers of cases were 6,730, 5,429, and 6,706, respectively Each geographic area, except the New England and Middle Atlantic and the East North Central, reported slight increases over the corresponding period last year. Those areas each reported a 25-percent decrease.

Poliomyelitis—The number of cases of poliomyelitis reported for the 4 weeks ended January 27 was 97, as compared with 82, 156, and 194 for the corresponding period in the years 1933, 1932, and 1931, respectively In all sections of the country, except the South Atlantic and Pacific, the incidence was closely approaching the level of the rather normal years 1930 and 1929 The number of cases reported (30) from the Pacific area was 2 5 times that for the same period last year, and in the South Atlantic the number (13) was twice that of last year. Other areas closely approximated last year's incidence

Mortality, all causes—The average mortality rate from all causes in large cities as reported by the Bureau of the Census for the 4 weeks ended January 27 was 12.6 per thousand population (annual basis). For this period in the years 1933, 1932, and 1931 the rates were 13.1, 12 3, and 14.5, respectively. The rates for this period in 1933 and 1931 were rather high because of minor influenza epidemics, but the current rate compares favorably with 1932, which was relatively free from influenza in this period.

EFFECT OF FLEA PASSAGE ON EPIDEMIC TYPHUS VIRUS

By R. E. DYER, *Surgeon, United States Public Health Service*

The difference between the reaction of laboratory animals to epidemic typhus virus and endemic typhus virus has been stressed particularly by Mooser in his reports. In the male guinea pig it is recognized generally that strains of endemic virus produce redness and swelling of the scrotum, while infection of animals of this sex and species with epidemic virus only in rare instances produces this reaction. Furthermore, the scrotal reaction occasionally seen in animals infected with epidemic virus is seldom intense and usually fleeting in character. We have had under observation for several years a strain of epidemic typhus virus which we received from Maxcy in 1929, who, in turn, procured it from Breinl 3 years earlier. Male guinea pigs inoculated with this strain of epidemic virus occasionally show a moderate scrotal redness and swelling which usually disappears in 24 to 48 hours. We have attempted on several occasions to perpetuate this reaction in subsequent passage generations of guinea pigs but have failed except in one instance. In this instance, which occurred in the fall of 1929, a guinea pig killed on the eighth day of fever occasioned by inoculation with the Breinl strain of epidemic virus showed testicles covered with exudate, and hemorrhages in the tunica. The testicles were washed in salt solution and the washings used to inoculate other guinea pigs. These animals and over 80 percent of the 154 guinea pigs used in the succeeding transfer generations showed reactions of the scrotum typical of those caused by endemic typhus virus.

Since we were experimenting with fleas at the time, and in view of the later discovery of the part played by fleas in the transmission of typhus, it seemed possible that, through accident, escaped fleas might have become infected with the Breinl virus and have been responsible for infecting the original guinea pig which showed the typical endemic typhus reaction although he had been inoculated with virus from the Breinl epidemic strain. This explanation would fit in with Mooser's observation that Nicolle's strain of epidemic virus after passage through fleas acquired to some extent the characteristics of an endemic virus.

In view of the foregoing, we passed the Breinl strain of epidemic virus through rat fleas (*Xenopsylla cheopis*) three successive times, carefully observing all guinea pigs inoculated with the virus after each flea passage. In carrying out this experiment we allowed noninfected fleas to feed on white rats which had been inoculated with the Breinl strain of epidemic typhus virus. After allowing for an incubation or multiplication period in the flea, a number of these arthropods were ground up in salt solution and injected into guinea pigs (only

male animals being used) The virus was then perpetuated in other guinea pigs for several generations, care being taken to select for transfer any animals which showed any signs of involvement of the scrotum After the first flea passage, the virus was maintained for 24 passage generations in guinea pigs, a total of 216 guinea pigs being used These guinea pigs reacted in a manner which was typical of the reaction caused by the original Breinl strain of virus Virus from this first flea passage strain was used to infect fresh white rats on which fresh noninfected fleas were allowed to feed The virus was again recovered from these fleas and studied in guinea pigs as before, with the same failure to find evidence of any change in the virus. In the study of this second flea passage virus 168 guinea pigs were used in 15 guinea pig passage generations After a third passage of the virus through fleas, carried out as before, the virus was maintained in guinea pigs for 14 passage generations (160 guinea pigs) without evidence of variation from the epidemic type After this last flea passage strain had been maintained in guinea pigs for 12 passage generations it became contaminated with the strain of *S enteriditis* described by Badger. Guinea pigs having the cross infection with this organism showed scrotal lesions which grossly could not be differentiated from those caused by endemic typhus virus

CONCLUSION

After passing epidemic typhus virus through fleas three times we were unable to find evidence of change in the type of the virus.

VOLUME CHANGES OF TUMOR CELLS IN VITRO

By M. J. Shear, *Biochemist*, and L C Fogg, *Cytologist, Office of Field Investigations of Cancer, United States Public Health Service*

Comparatively little attention has been paid to the role of water in the biology of cancer. From analyses of the water content of malignant tumors (Wolter, 1913; Cramer, 1915–16; Robin, 1919*a*; Simonini, 1924; Roffo, 1925; Lewis, 1927, Marvelli, 1930; Cavina, 1931; Morávek, 1932; Guastalla, 1931, Uramoto, 1932; Schlottmann and Rubenow, 1932), it has been concluded that cancerous tissues contain more water than do normal tissues. In addition, Roffo (1930) has reported that neoplastic tissue is more sensitive to dehydration than is normal tissue. Of considerable interest are the reports which indicate that tumor tissue has an imbibition capacity different from that of normal tissue (Robin, 1919*b*; Lasnitzki, 1928; Magath and Kolomijetz, 1930; Roosen, 1932). In most of the papers cited here, the amount of data on the water content of tumors is not impressive; few of them are as comprehensive as the earlier work of Cramer (1915–16). As for

reports on other aspects of the role of water in cancer, much of them, aside from the contributions of Magath and his collaborators, is speculative. Nevertheless, these various findings were sufficiently suggestive to warrant investigation of fluid exchange in tumor tissue.

Considerable attention has been devoted to the increase in cell volume, due to increased water inflow, on immersion of cells in solutions However, most of this type of work has been done with eggs and other cells of invertebrates, and with mammalian red blood corpuscles, but little has been reported with respect to this phenomenon in parenchymatous tissue cells of mammals

A study of the behavior of mammalian tissue on immersion in solutions was therefore undertaken, with attention focused on changes in cell volume Obviously, a number of factors are involved in fluid exchange. The permeability of the cell membrane, the tonicity of the external medium and of the cell contents, the imbibition capacity (colloid osmotic pressure) of the cell contents and of the outside solution, the surface tension at the interface, and the intracellular turgor pressure (Duff, 1932; Adolph, 1933) are some of the important factors. Without attempting to separate the part played in fluid exchange by these various factors, the net result of water inflow and outflow upon immersion in various solutions was determined by observation of the cell volume.

Observations were made with both normal and neoplastic tissue. Upon immersion in solution, increase in cell size was noted in a short time. This increase took various forms; sometimes there was a generalized cellular swelling, and sometimes vesicles of clear fluid were protruded from the cells This phenomenon occurred with both normal and malignant tissues.

Since little is known about the mechanisms which regulate fluid exchange in parenchymatous tissue cells of mammals, this cellular swelling was studied in some detail The effect of the various constituents of blood fluids upon changes in cell size was determined by a systematic variation of the concentration of each constituent. Tumor tissue provided exceptionally favorable material for such a study, since the cells of young, actively growing tumors regularly exhibited this swelling phenomenon a short time after immersion in solution.

It was found that none of the inorganic constituents or of the simple organic constituents of blood fluids, when used in physiologically possible amounts, produces an inhibiting effect on this increase in volume in tumor cells. The swelling is not due to hypotonicity, for it also occurs in solutions which are definitely hypertonic.

Of course, neither "physiological saline" nor "physiologically balanced salt solution" constitutes a normal environment for mammalian cells; and hence the possibility had to be considered that the swelling

noted in inorganic solutions may possibly have resulted from some injury to the cells Furthermore, when fragments of tissue are excised, the mere separation from contiguous cells may produce some injury, and hence such explanted cells may not be entirely normal. While injury to the cells must be considered as possibly being the cause of the swelling, experiments now in progress raise the question as to whether the reverse may not be the case, i.e , that injury is the result and not the cause of the swelling

It is only by isolating tissue *in vitro* that the composition of the surrounding fluid can be changed at will and the effect of the changes noted immediately by direct observation of the cells The information obtained by such procedures may be of value in throwing light on the factors involved in fluid exchange in cells.

PROCEDURE

Fresh tumor tissue was dissected free from necrotic areas and was immediately cut into fragments in the solution to be tested The pieces were then mounted in a hanging drop of the test solution on a depression slide, and sealed with a vaseline-paraffin mixture, employing the usual tissue-culture technique

The solutions used for immersion of the fragments were prepared from analyzed reagent chemicals. They were adjusted before using to pH 7, employing a 0.04 percent solution of phenol red as indicator. At first adjustment was made to pH 7.4, but loss of CO_2 during the manipulations brought the pH up to about 8; consequently, the pH was made about 7 to allow for the loss in CO_2 during the preparation of the hanging drop The swelling was noted over a rather wide pH range; slight variations in pH produced no pronounced effect upon the increase in cell volume (see p. 231). In most cases pH adjustment was made with a stream of air or of CO_2.

In the case of transplanted tumors, only actively growing young tumors were employed. *Unless otherwise stated, the experiments were conducted with mouse sarcoma 180.*

INORGANIC SOLUTIONS

A characteristic behavior was noted in all of the inorganic solutions. A short time after immersion, the cells began to increase in volume. The isolated cells scattered throughout the drop, as well as the cells forming the outer borders of the tissue fragments, exhibited this behavior. Variation of the concentrations of the constituents of the solution within physiological limits did not have an inhibiting effect on the swelling.

The increase in size took various forms. Sometimes there was a uniform, generalized swelling; sometimes the protoplasm occupied one part of the swollen cell and apparently clear fluid occupied the

remainder of the cell; but often a portion of the cell wall protruded to form an outpocketing or "bulge" These bulges, or vesicles, at first small in size, increased until they were sometimes larger than the original cell In many instances the bulge ruptured, with liberation of the cell contents In some cases, especially with mouse sarcoma 37 and Rous chicken sarcoma, as many as 2, 3, and even 4 bulges were seen protruding from a single cell.

Sometimes a bulge was "pinched off" and formed a spherical "globule" of apparently clear fluid. In such cases, as the bulge grew larger, it remained connected with the cell by a narrow bridge, forming a dumbbell-shaped structure, finally, it parted from the cell to form a spherical globule.

DISTILLED WATER

Pronounced swelling occurred rapidly in distilled water. The pieces of tumor rapidly disintegrated and the gelatinous fragments clumped together. There were many swollen cells and a large amount of cellular debris in a few minutes.

Similar results were obtained with Rous chicken sarcoma.

SODIUM CHLORIDE

In solutions which contained 145 to 155 mM sodium chloride,[1] swollen cells, bulges, and globules began to be in evidence about a half hour after immersion Sometimes swelling was noted a few minutes after immersion. At the end of 2 hours there were numerous swollen cells and considerable debris from ruptured cells. This process went on until, after several more hours, most of the cells were seen to be affected.

Similar results were obtained with mouse sarcoma 37, spontaneous Buffalo [2] mouse adenocarcinoma, and Rous chicken sarcoma. In the case of sarcoma 37, concentrations of 150, 155, 163, 171, and 180 mM sodium chloride were employed; these solutions were buffered with 1.5 mM of sodium phosphate. Similar results were obtained at all concentrations.

Stronger solutions of sodium chloride (250, 450, and 855 mM, and 1.71 M) produced a strikingly disruptive effect on the explants. Within 10 minutes after immersion the smaller explants were completely disintegrated and the larger pieces of tissue were surrounded with a wide area of innumerable cells and gelatinous debris. The cells were pale and distorted, some showing typical bulges. Globules were numerous. Similar results were noted with mouse sarcoma 37, mouse carcinoma 63, and Rous chicken sarcoma.

[1] 0.85 percent NaCl is 145 mM; 0.90 percent NaCl is 154 mM, 0.95 percent NaCl is 163 mM; 1 percent NaCl is 171 mM, 1 05 percent NaCl is 180 mM; 5 percent NaCl is 855 mM; 10 percent NaCl is 1 71 M

[2] Obtained from Dr M. C. Marsh, New York State Institute for the Study of Malignant Diseases, Buffalo, N.Y.

These results were quite the opposite of the picture of a shrunken explant with contracted cells, which might have been expected in strongly hypertonic solutions. These effects appeared to be due not so much to excessive fluid intake as to severe injury produced by the high salt concentrations. It may be that such strong salt solutions exert a destructive effect upon the outer surface of the cell.

INORGANIC SERUM SOLUTIONS

In the preliminary experiments with solutions of relatively low salt concentration, the assumption seemed plausible that the inflow of water might be due to the hypotonicity of the solutions employed. *However, when similar increases in cell volume were observed with definitely hypertonic solutions, it was obvious that it was not a question of tonicity* The possibility was next considered as to whether any of the common inorganic constituents of blood serum might be important factors in this fluid exchange

Accordingly, solutions were prepared which approximated the inorganic composition of average blood serum or plasma (*cf* Peters and Van Slyke, 1931) A total base concentration of 155 milli-equivalents per liter was selected, not because it was considered to be isosmotic with blood fluids but because this is the content of total base present in serum The composition of our inorganic serum solution was as follows:

Base content of inorganic serum solution

$NaCl$	112 milli-equivalents per liter
KCl	5 milli-equivalents per liter
$NaHCO_3$	30 milli-equivalents per liter
$CaCl_2$ [a]	3 milli-equivalents per liter
$MgCl_2$	3 milli-equivalents per liter
Na_2HPO_4	2 milli-equivalents per liter
Total base	155 milli-equivalents per liter

Such solutions are best prepared by adding the constituents in the order given, with particular attention paid to the pH. It was found convenient to prepare separate stock solutions of each constituent and to use suitable aliquot portions in making up the mixtures. After the addition of $NaHCO_3$, a stream of CO_2 is bubbled through until the solution becomes yellow to phenol red. Before the addition of phosphate, more CO_2 is run in if the solution is not yellow. Immediately before using the solution in an experiment, a stream of air is bubbled through to remove excess CO_2 until the desired pH is

[a] Although the normal value for serum calcium is 10 mg percent, only about half of it is diffusible Hence 6 mg percent (3 milli-equivalents per liter), rather than 10 mg percent, has been used here as a closer approximation to the concentration of *ionized* calcium in serum. (For a discussion of the concentration of calcium ions in serum see Shear, 1933)

attained Unless precautions are taken to keep such solutions acid when not in use, precipitation of calcium phosphates is likely to occur, especially if the solution is allowed to become more alkaline than pH 7 5 for any considerable length of time before being used.

A number of solutions were prepared in which the amounts of the various constituents were varied slightly from those of the inorganic serum solution In others, the concentrations of all the constituents were kept constant with the exception of NaCl, which was varied so as to give solutions with a total base content of from 130 to 180 milli-equivalents per liter

In all of these solutions the usual increase in cell size occurred; there were numerous swollen cells, bulges, and globules an hour or two after immersion Neither minor variations in the concentrations of the various constituents nor the variations in the total ionic strength stated above had an inhibiting effect on this phenomenon

The behavior of a number of other types of malignant tumors of various origins was similar to that of mouse sarcoma 180 These results are discussed in a later section (see page 235).

pH

As stated previously, most of the solutions contained bicarbonate, and the adjustment of pH was effected by a stream of CO_2 or of air. To test the effect of varying the acidity, mouse sarcoma 37 was cut up in inorganic serum solution adjusted to pH 5, 7, and 9. Within half an hour swelling began to be noted at all three hydrogen-ion concentrations, and large bulges were obtained in all solutions.

Inasmuch as the pH of such solutions changes toward the alkaline side because of loss of CO_2, the effect of pH variation was more carefully studied by using solutions buffered by phosphate. Solutions were prepared having a composition analogous to the inorganic serum solution except for bicarbonate and chloride—no sodium bicarbonate was present, and additional sodium chloride was added so as to keep the total base constant at 155 milli-equivalents. The buffering was effected by phosphate, which was present in concentrations of 1.5 and 3.0 mM.

The pH of these solutions was varied from 5 to 10, using HCl and NaOH for adjustment. A concentration of 4.7 mg phosphorus per 100 cc was sufficient to maintain the pH constant for hours even when the solution contained a considerable amount of minced tumor tissue. Two types of tumors were studied. mouse sarcomas 180 and 37.

In these solutions, which contained no bicarbonate, swelling with bulging was noted at all hydrogen-ion concentrations between pH 5 and 9. In solutions more alkaline than pH 8.5, disintegration of another sort was common: the "cell wall" seemed to dissolve, leaving a mass of sticky, granular, protoplasmic debris. This was also noticeable macroscopically from the way the tissue fragments in the more

alkaline solutions adhered to one another and stuck to the capillary pipette The greater the alkalinity of the solution, the more rapid and the more pronounced was this type of disintegration.

The characteristic swelling phenomenon, consisting of bulges, globules, and swollen cells with areas of clear fluid, appeared to be somewhat more prevalent in slightly alkaline solution, in the range between pH 7.5 and 8 Minor variations in pH did not seem to have a pronounced effect on the swelling.

Temperature —A few experiments were performed to see what effect temperature had on this swelling. The process appeared to proceed somewhat more rapidly at 38° C. than at room temperature, but the difference was not striking

POTASSIUM

As stated above, the concentration of sodium chloride was varied between wide limits without preventing or hindering the swelling. The concentration of each of the other inorganic constituents was then varied systematically from zero to beyond the amount physiologically normal for blood serum, and the effect on swelling was determined. The total base was kept constant in all these solutions by increasing or decreasing the concentration of sodium chloride to compensate for the decreases or increases in concentration of the constituent under study. In all of the experiments, some of the tumor tissue was mounted in the inorganic serum solution for comparison

A series of 6 solutions was prepared with a composition analogous to that of the inorganic serum solution, except that the potassium content was varied from 1 to 18 mM With potassium concentrations up to 9 mM, the usual swelling, accompanied by bulges and globules, was noted; with 12 mM potassium only a few cells were swollen; with 18 mM potassium negative results were obtained as far as the swelling was concerned.

(The normal[3] amount of potassium in serum is 5 mM.)

CALCIUM

A series of five solutions was prepared which differed from the inorganic serum solution only in calcium content, which was varied from 0 to 4.5 mM. Swelling was obtained in all solutions

(The normal [3] calcium-ion concentration of serum is believed to be not greater than about 1.5 mM See also footnote on page 229.)

MAGNESIUM

In a similar fashion the magnesium content was varied between 0 and 4.0 mM, the other constituents of these four solutions being kept at the same concentration as in the inorganic serum solution. Swelling was obtained in all four solutions.

(The normal[3] magnesium content of serum is about 1 5 mM.)

[3] The normal values for these constituents are those given by Peters and Van Slyke (1931) for man

BICARBONATE

Six concentrations of bicarbonate were employed: 0, 10, 20, 30, 40, and 60 mM. The other constituents were the same as in the inorganic serum solution. The usual swelling was observed at all concentrations.
(The normal [3] bicarbonate content of serum is about 30 mM.)

In an analogous fashion the phosphate content was varied from 0 to 4.0 mM. At all of the six phosphate concentrations the typical swelling phenomena were noted.
(The normal [3] serum phosphorus varies from about 1 to 2.5 mM, depending upon the age of the individual.)

OTHER INORGANIC SOLUTIONS

On immersion in Ringer solution, Locke solution, Ringer-Locke solution, Tyrode solution, and Drew solution, the same phenomena were observed.
A solution was made up similar to Locke solution, except that all the constituents were present in 10 times the usual concentration. The cells were rapidly affected in a manner similar to that previously noted in strong NaCl solutions.

SIMPLE ORGANIC CONSTITUENTS

Since none of the inorganic constituents of serum, when varied within physiological limits, appeared to have an inhibiting effect on swelling, the effect of the simple organic constituents of blood serum was studied. These organic compounds were added, in varying amounts, to solutions that had the same inorganic composition as the inorganic serum solution. They thus constituted closer approximations to the composition of blood serum than did the purely inorganic solutions. In all cases, simultaneous experiments were done with inorganic serum solution for purposes of comparison.

GLUCOSE

Four solutions were prepared containing the following amounts of glucose: 0, 75, 150, and 250 mg per 100 cc. The usual swelling effects were noted.
(The normal [3] value for glucose is variously given as 75 to 100 mg percent, depending upon the method used.)

UREA

Four solutions were prepared containing 0, 19, 38, and 57 mg percent of urea nitrogen, respectively. Swelling occurred in all solutions.
(The normal [3] value for urea nitrogen is 19 mg percent.)

[3] The normal values for these constituents are those given by Peters and Van Slyke (1931) for man.

AMINO-ACID

Four solutions were prepared containing 0, 6, 12, and 18 mg percent nitrogen in the form of cysteine Swelling occurred in all solutions.

(The normal[3] value for amino-acid nitrogen is 6 mg per 100 cc.)

URIC ACID

Four concentrations of uric acid (0, 4, 7 5, and 10 9 mg uric acid per 100 cc) were tested Swelling was noted in all solutions.

(The normal[3] value for uric acid is 4 mg per 100 cc)

OTHER SOLUTIONS

Solutions were next prepared which contained, in addition to the inorganic constituents, these four organic compounds in various proportions

Such solutions, because of the presence of the organic compounds, reproduce physiological conditions more closely than does the inorganic serum solution The most complete of these solutions had the following composition·

Artificial serum solution

	mM
Glucose, 75 mg per 100 cc	4 2
Urea, 40 mg per 100 cc	6 7
Amino-acid nitrogen,[4] 6 mg per 100 cc	4. 3
Uric acid, 4 mg per 100 cc	0 24
NaCl, 655 mg NaCl per 100 cc	112
KCl, 19 5 mg K per 100 cc	5
$NaHCO_3$, 183 mg HCO_3 per 100 cc	30
$CaCl_2$, 6 mg Ca per 100 cc	1. 5
$MgCl_2$, 3 6 mg Mg per 100 cc	1 5
Na_2HPO_4, 3 1 mg P per 100 cc	1

In all instances, the usual swelling, with bulges and globules, was observed.

SERUM AND PLASMA

SERUM

Mouse serum was diluted with inorganic serum solution in various proportions, and the solutions were then tested for their effect on the swelling of mouse sarcoma 180. The concentration of serum was varied from 10 to 100 percent. Swelling, accompanied by bulging and globule formation, occurred at all dilutions, but at a much slower rate than in the solutions previously described.

The effect of undiluted serum was not studied in detail—only a few experiments were carried out. Mouse carcinoma 63 was cut up in

[3] The normal values for these constituents are those given by Peters and Van Slyke (1931) for man

[4] In the form of 67 5 mg per 100 cc of cysteine hydrochloride, or 63 mg per 100 cc of d-glutamic acid The former was used because of its oxidation-reduction properties, the latter was employed as a control Other amino-acids may be employed in their stead

normal mouse serum and in immune mouse serum,[5] little evidence of swelling was obtained in either serum in 2 hours Sarcoma 180 cut up in dog serum showed little sign of swelling in 2 hours, it was only at the end of 10 hours that globules and bulges were frequent Rous chicken sarcoma in dog serum showed no sign of swelling in 6 hours. Sarcoma 180 in horse serum did not show much evidence of swelling until 5 hours had elapsed

The few experiments performed with various tumors cut up in various types of sera showed that the swelling of cells, accompanied by bulge and globule formation, occurred at a considerably slower rate than in the solutions previously described.

PLASMA

When tumor tissue was immersed in heparinized mouse plasma, results were obtained which were entirely different from those noted in serum. When undiluted plasma was used, the entire preparation clotted as soon as the tissue was cut up in it When plasma diluted with inorganic serum solution was used, clot formation also occurred, but to a lesser extent. In solutions containing 15 percent or more of plasma, the tumor explants were surrounded in a few minutes with a layer of transparent clot. In solutions which contained less than 15 percent plasma, a clot of appreciable width did not always form about the explant, but the presence of a restraining film of clot was shown by the regularity of the borders of the explants. This regularity was characteristic, for in serum, as in the solutions described in preceding sections, the borders of the explant were irregular and numerous individual cells were scattered throughout the liquid.

In solutions which contained considerable amounts of plasma, a wide clot was noted surrounding the explant, while in dilute plasma solutions a thin film of clot was obtained. When the film was quite thin, it was occasionally noted to rupture in a few places. When this happened the cells which were exposed to the solution showed the usual swelling, accompanied by bulges and globules.

The formation of this clot was but slightly affected by urea, which was employed because of its solvent effect on fibrin (Foulger and Mills, 1930; Menkin, 1932). Plasma, diluted with equal volume of inorganic serum solution, was compared with a similar 50 percent plasma solution which contained 5 g of urea per 100 cc; the clot formed in the urea solution, but it was less readily made out, apparently because it was less dense. Stronger urea solutions, such as those used by the above-mentioned investigators, would most probably have prevented clot formation, but it was considered inadvisable to employ high urea concentrations for fear of injuring the exposed cells.

[5] Mice immune to sarcoma 180, and hence to carcinoma 63 as well, were furnished by Dr. H. B. Andervont (1932) of this laboratory

When citrate was used, however, the formation of clot was inhibited. Plasma was diluted with an equal volume of inorganic serum solution to which had been added $2Na_3C_6H_5O_7 11H_2O$ No clot formed around the tumor explants in 50 percent plasma solutions when they contained 1 0, 1.5, or 2 0 g of sodium citrate per 100 cc In such solutions, the borders of the explants were irregular and swelling of the cells occurred, as in serum

The limiting concentration was 0 5 percent sodium citrate. At this strength some of the borders of the explants were irregular, as in serum, while other borders were smooth, indicating the presence of a narrow film of clot When 0 25 g of sodium citrate was present per 100 cc of the plasma solution, a definite clot was noted in a few minutes around the tumor fragments

Thus, the formation of clot about sarcoma 180 in 50 percent plasma solutions may be inhibited by the use of 0 5 percent or more of sodium citrate

Mouse carcinoma 63 behaved in mouse-plasma solutions in a similar fashion Sarcoma 180 gave the same results in dog-plasma solutions as in mouse-plasma solutions.

OTHER TUMORS

A number of different types of tumor, obtained from various species, were tested by immersion in the inorganic serum solution. In many instances, several tumors of each type were tested; in others, only one tumor was available. In all instances swelling of the cells, accompanied by bulge formation, occurred in a short time.

The types of tumor so tested are listed in the following table:

Tumor	Source	Comment
Sarcoma 180	Albino mouse	Swelling
Carcinoma 63	do	Do
Carcinoma 27	do	Do
Carcinoma 206	do	Do
Sarcoma 37	do	Many cells with more than 1 bulge.
Do	Brown mouse [a]	Do
Spontaneous Buffalo carcinoma	Albino mouse	Swelling
Transplanted Buffalo carcinoma	do	Do
Spontaneous carcinoma	Brown mouse [a]	Do.
Transplanted carcinoma	do	Do
Spontaneous carcinoma	Albino mouse	Do
Rous sarcoma	Chicken	Many cells with more than 1 bulge
Rous sarcoma metastases	do	Do
Transplanted carcinoma	Rat	Swelling
Spontaneous mammary tumor [b]	Dog	Do
Mammary carcinoma	Human	Do
Gastric carcinoma	do	Do
Rectal carcinoma	do	Do
Pituitary carcinoma	do	Do

[a] Pure C_3H strain obtained from Roscoe B Jackson Memorial Laboratory, Bar Harbor, Maine
[b] Benign tumor.

These tumors all showed the characteristic increase in cell volume on immersion in the inorganic serum solution.

DISCUSSION

Since the swelling of cells of parenchymatous tissues of mammals upon immersion in solutions does not appear to have been previously studied, a number of normal tissues of the mouse were examined from this point of view. Cellular swelling was seen to occur in several of them. Of the normal material examined, swelling was most pronounced in spleen, testes, and in embryo tissues

Hence the swelling phenomenon described in this paper is not an exclusive characteristic of tumor cells only. While the swelling has been noted with normal tissues, the rapidity and extent to which it occurs does not appear to be the same for all tissues. Consequently, until some quantitative method for estimating the rate and degree of swelling is devised, it cannot be definitely stated that there is a characteristic difference between normal and tumor tissue in this respect.

The swelling reported in this paper is not to be ascribed to hypotonicity of the solutions employed, for it occurred regularly in solutions that were definitely hypertonic. Incidentally, it was interesting to note that, alongside of the tumor cells that were taking in water and increasing in size, numerous red blood cells were in various stages of crenation.

The swelling may possibly be due to a high imbibition capacity of the colloids contained in the cells This possibility is indicated by some other experiments now in progress in which the swelling of tumor tissues was offset by immersion in concentrated protein solutions; such solutions have high colloid osmotic pressures When dilute solutions were employed, swelling of the cells occurred; as the concentration of protein was increased, less swelling was noted; and in the most concentrated solutions the cells seemed to have become shrunken.

The formation of clot in solutions which contain plasma may possibly account, in part, for the success which investigators have had in culturing tumor tissue *in vitro* in plasma media. Even when only a small amount of plasma is present, a thin clot is formed. Sometimes the clot is a film so thin as to elude observation as such, and its presence is made known only by the behavior of the explant. In serum solutions, the cells swell and are destroyed; in plasma solutions, no swelling is noted except when the clot ruptures. The failure on the part of many workers to obtain satisfactory culture of tumor tissue in serum and serum solutions may possibly be due in part to the swelling which occurs in such culture media.

Lumsden (1931), working with mouse carcinoma 63, observed that anti-M_{63} serum produced a shrinkage of the cell contents into a ringlike mass with irregularly crenated border, but that "outside this a second outline is seen composed of the cell wall bellied out by

endosmosis, which is sometimes so intense as to burst the cell membrane." Although neither normal nor neoplastic tissues of mammals appear to have been studied from the point of view of cellular swelling, more is known in this regard about chick embryo tissue Cash (1919), in studying the effect of ether vapor on explants of chick embryo tissues, noted clear, homogeneous vesicles bulging out at points on the surface of the cell

Apparently Hogue (1919) was the first to study in detail the effect of hypotonic and hypertonic solutions upon individual cell structures with the aid of tissue-culture technique. Hogue employed embryonic chick heart in her investigation and made observations which were similar in a number of respects to those reported in this paper. The inflow of water which Hogue observed was not due to hypotonicity, for the vacuoles (blebs, vesicles, bulges) were also obtained in *hypertonic* solutions Hogue noted "balloon-like structures * * * which formed along the edges of the culture * * * Upon close observation these structures were seen to begin as small hemispheres rising out of the explant. In time they became almost spherical and increased in size as though something from the tissue was being poured into them."

Another type of structure, which Hogue called "granular hills", was also noted· "They grew in size, sometimes becoming quite large, though they were most frequently seen as small balls or hills along the edges or between the angles of the tissue. They were very finely granular. Sometimes the surface tension would be taxed too much and the granular hill would break open at one place, pouring the fine granules into the surrounding medium." Drawings of these structures were given. In the case of tumor tissue we have made similar observations, i.e., the bulges and globules sometimes contained granular material instead of the usually apparently clear fluid

Hogue discussed the question as to whether these structures were composed of the same material that Burrows and Neymann (1917) noted It seems to us, however, that the structure observed by Burrows and Neymann is probably akin to the fibrin clot described in a preceding section of this paper, since they stated that "A cell brought in contact with the surface of this transparent substance adheres to it and flattens over its surface." This is what we have repeatedly noted at the outer edges of the fibrin clot which forms about the explant in plasma solutions.

Similar phenomena in swelling cells were observed by Loeb and Blanchard (1922), who investigated the effect of solutions of various neutral salts on cells, using the tissue-culture technique. They studied the effect of a number of salts, with and without the addition of acid or alkali, on the volume of Limulus cells. In the cells of this invertebrate they noted swelling, "balloons", and other structures analogous to those described by Hogue.

W. H. Lewis (1923) observed chick-embryo cells in tissue cultures by means of dark-field illumination, and noted "spherical blebs" on the cells "The blebs varied in size and were occasionally as large as a contracted cell * * *. Frequently one would burst, freeing its granular contents into the surrounding fluid medium * * *." In studying reversible gelation in living chick-embryo cells, M. R. Lewis (1923) noticed "fluid blebs" along the edges of cells.

Rosenfeld (1932) confirmed the findings which Cash (1919) reported on the action of ether on cells. Similar "clear vesicular blebs, granular bulbous processes, rounded pseudopods" were noted, in which "No visible membrane can be distinguished at the periphery."

It is the consensus of opinion that these increases in cell volume, with the development of these characteristic cell structures, are due to disturbed fluid exchange, i. e., more water flows into the cells than flows out, with a consequent progressive increase in cell volume. The question arises as to whether this swelling phenomenon occurs only in dead cells or whether it occurs in live cells and is itself the cause of cell death.

Explants of sarcoma 180 are not killed by immersion for 1½ hours in Tyrode solution, although swelling is evident by that time. Hanging drops were prepared, and at the end of 1½ hours, when swelling of the cells was evidenced by the appearance of bulges and globules, the pieces of tissue were transferred to plasma clots according to the usual tissue-culture technique All five of the explants were alive the next day. This demonstrated that, although swelling had occurred, the explants were not killed.

According to Hogue, the blebs form *before* the cell dies. In hypotonic Lewis-Locke solution, Hogue found that "the cells frequently become swollen with the intake of water as soon as they have been treated with the hypotonic solution. They remain in this condition for an hour or so, until the cell has begun to undergo the changes following death, when they show shrinkage." In hypertonic Lewis-Locke solution, explants of chick-embryo heart, on which the "balloons and granular hills" appeared, would often continue to beat for several days. Blebs began to form while the cells were still alive, for blebs were noted in cells in which the granules alone were stained with neutral red.

Since the bulges and globules have a refractive index that is very close to that of water, and since the "membrane" between the two phases is so delicate, these structures may readily escape notice unless especial search is made for them. A number of vital stains were employed in an attempt to render them more obvious, without conspicuous success. The development of these structures was not inhibited, in general, when vital stains were present; with some stains the bulges and globules were seen to take up a small amount

of dye No particular stain has, up to the present, been found to be strikingly helpful in this respect The best results were obtained with neutral red After staining the tumor fragments on the cover slip with some of the test solution to which neutral red had been added, the colored solution was removed by washing several times and replacing with colorless test solution. In this way the bulges and globules were seen faintly pink in a colorless medium.

None of the inorganic or organic substances described in this report, when used within physiological limits, was found to affect the swelling of cells. The swelling in serum, however, occurred at a much slower rate than in the solutions. This suggested that proteins might be a controlling factor in this fluid exchange The effect of proteins was consequently studied The results will be presented in a subsequent report.

SUMMARY

1. Explants of normal and tumor tissues were exposed to solutions and the changes in cell volume observed by means of the hanging-drop technique. Cellular swelling was noted with both types of tissue.

2 Employing tumor tissue as experimental material, the effect of the inorganic and simple organic constituents of blood serum upon cellular swelling was determined by systematically varying the concentration of each constituent. When varied within physiological limits, none of these constituents prevented swelling.

3. The swelling occurred in hypertonic solutions as well as in isotonic and hypotonic solutions.

4. The significance of this phenomenon is discussed together with similar observations reported by others on nonmammalian tissue cells.

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COURT DECISION RELATING TO PUBLIC HEALTH

City ordinance regulating barbering, beauty culture, and manicuring upheld—(Virginia Supreme Court of Appeals; *Ransone, Health Officer*, v. *Craft et al.*, 170 S E 610; decided Sept. 21, 1933.) Certain barbers filed a bill in equity challenging the validity of an ordinance of the city of Roanoke, which imposed requirements governing barbers, beauty culturists, and manicurists The lower court declared the ordinance void and enjoined the city health officer from enforcing any of its provisions, and from the decree an appeal was taken.

One of the grounds upon which the trial court based its conclusion was that the State board of health, under statutory authority, had made regulations on the same subject, with which the ordinance was in conflict and, therefore, void. The appellate court said that the bill of complaint did not allege that the ordinance was in conflict with any regulation adopted by the State board of health and that there was nothing in the record on which to base the statement in the trial judge's opinion that the two were in conflict. Under these circumstances the finding of the trial court on the point was not sustained.

Another ground upon which the trial court based its conclusion was that the legislature had passed no general law empowering municipalities to adopt regulations of the kind in question and that the ordinance was a private, special, and local law and within the inhibition of section 65 of the State constitution. The appellate court, after quoting several excerpts from the charter of the city of Roanoke, including some relating to the preservation of health and the prevention of the introduction or spread of communicable diseases, said:

> It appears from these provisions, if valid, of the city charter that the city counsel [council] had express authority to pass an ordinance regulating such trade or calling. However, it was held by the trial court that the general assembly

was prohibited by section 65 of the Virginia constitution from delegating any such authority to the municipality except by general law and that the legislature had passed no general statute on the subject. In other words, that the provisions of the city charter quoted above constituted "local and special legislation", applicable only to the city of Roanoke, and, for that reason, such grant of power was within the prohibition of section 65. It has been repeatedly held by this court that charters of municipal corporations or amendments thereto, conferring rights and powers different from and in addition to those conferred by general statutes, are authorized by the constitution when enacted in accordance with article 4 (secs. 40–68) and section 117 of the constitution. [Citations.]

Continuing, the court said:

In the absence of evidence to the contrary, there is a prima facie presumption that the charter or an amendment thereof was enacted in the manner required by the constitution and that the rights and powers conferred are within the legislative power to grant. There is not a suggestion in the record tending to show that the charter of the city of Roanoke was not enacted in the manner required by article 4 and section 117 of the constitution.

The charge that the provisions of the ordinance were harsh, unreasonable, and arbitrary was said by the appellate court to be made in very general terms and with no proof offered to support the allegation, and the court did not feel constrained to analyze each section to find one provision of doubtful value or which might under some circumstances work a possible hardship. The court stated that some evidence introduced by complainants tended to show that a compliance with the ordinance would require an outlay for each shop in excess of $100, but went on to say that a careful analysis of the evidence and of the ordinance itself clearly showed that a compliance did not necessarily require an outlay for each operator of more than $10. "When the object sought to be obtained is considered", said the court, "it cannot be said that this requirement is either unreasonable or arbitrary."

The decree of the lower court was reversed and final decree entered for the respondent health officer.

DEATHS DURING WEEK ENDED JANUARY 27, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Jan. 27, 1934	Corresponding week, 1933
Data from 86 large cities of the United States:		
Total deaths	8,758	8,913
Deaths per 1,000 population, annual basis	12.2	12.4
Deaths under 1 year of age	559	665
Deaths under 1 year of age per 1,000 estimated live births	52	[1] 57
Deaths per 1,000 population, annual basis, first 4 weeks of year	12.6	13.1
Data from industrial insurance companies:		
Policies in force	67,571,562	69,080,905
Number of death claims	14,695	16,666
Death claims per 1,000 policies in force, annual rate	11.3	12.6
Death claims per 1,000 policies, first 4 weeks of year, annual rate	11.0	11.8

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Feb. 3, 1934, and Feb. 4, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb 3, 1934, and Feb. 4, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933
New England States								
Maine	2	2	1	1,025	1		1	1
New Hampshire		1			228	1	0	0
Vermont		6			26		0	0
Massachusetts	12	33		56	2,228	197	2	2
Rhode Island	1	5	1	19	2		0	0
Connecticut	3	11	4	210	34	157	1	1
Middle Atlantic States								
New York	55	55	[1] 24	[1] 81	717	1,815	3	11
New Jersey	27	22	32	278	223	641	1	1
Pennsylvania	100	98			1,743	1,099	3	8
East North Central States								
Ohio	63	62	121	44	383	528	1	0
Indiana	40	46	88	116	702	16	2	2
Illinois	33	48	17	67	337	179	9	14
Michigan	12	24	2	37	43	504	0	2
Wisconsin	6	3	73	754	808	244	2	8
West North Central States.								
Minnesota	8	8		6	164	754	0	2
Iowa [2]	12	13	15		49		0	2
Missouri	51	34	15	30	1,120	282	2	4
North Dakota	2	4	5	699	130	55	0	0
South Dakota	1	1		8	579	3	0	0
Nebraska	15	9	35	276	88	17	0	1
Kansas	7	8	3	26	52	172	1	6
South Atlantic States								
Delaware	4	3		13	213		0	0
Maryland [3]	12	11	28	328	174	6	1	1
District of Columbia	13	5	1	4	215	4	0	0
Virginia	33	20			675	106	4	8
West Virginia	26	10	101	379	33	310	0	0
North Carolina	31	36	68	406	2,926	316	2	8
South Carolina [3]	9	17	808	2,286	377	74	0	1
Georgia [3]	21	18		571	938	2	3	1
Florida [3]	12	7	5	55	63	5	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb 3, 1934, and Feb 4, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933
East South Central States								
Kentucky	51	23	42	69	159		1	4
Tennessee	11	13	126	277	806	18	2	0
Alabama [3]	21	23	158	234	201	12	1	1
Mississippi [2]	16	18					1	0
West South Central States								
Arkansas	14	2	38	235	473	10	0	0
Louisiana	17	14	10	44	33	11	0	1
Oklahoma [4]	38	13	109	498	393		1	8
Texas [3]	139	100	452	597	991	558	3	2
Mountain States								
Montana	3	5	42	576	8	187	0	0
Idaho		4		4	97	88	0	0
Wyoming				8	51	30	0	0
Colorado	3	2		76	35	7	0	0
New Mexico	13	13	1	52	60	3	0	0
Arizona	1		18	24	21	4	1	1
Utah [2]	1				938	1	0	0
Pacific States								
Washington	2	11		1	399	9	3	1
Oregon	1	7	26	117	51	57	0	0
California	39	44	45	294	1,129	312	5	3
Total	981	912	2,514	10,880	21,119	8,794	56	85

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933
New England States								
Maine	1	0	18	41	0	0	2	5
New Hampshire	0	0	18	25	0	0	0	0
Vermont	0	0	20	16	0	0	0	0
Massachusetts	0	0	250	328	0	0	2	3
Rhode Island	0	0	15	31	0	0	0	0
Connecticut	0	0	68	149	0	4	0	1
Middle Atlantic States								
New York	0	2	726	1,052	0	0	4	10
New Jersey	0	1	178	304	0	0	1	3
Pennsylvania	0	0	812	1,038	0	0	16	6
East North Central States								
Ohio	1	1	823	518	0	22	8	5
Indiana	0	1	264	122	0	2	2	7
Illinois	2	1	493	475	3	16	6	9
Michigan	1	1	466	443	0	3	0	3
Wisconsin	0	0	183	177	35	8	2	0
West North Central States								
Minnesota	0	0	67	69	3	0	0	0
Iowa [2]	0	0	77	34	9	24	3	1
Missouri	1	0	165	117	10	1	1	6
North Dakota	0	0	40	18	0	0	0	0
South Dakota	0	0	18	21	0	0	0	1
Nebraska	0	0	36	24	1	6	0	1
Kansas	1	2	146	61	5	1	1	4
South Atlantic States:								
Delaware	0	0	19	10	0	0	0	1
Maryland [2]	0	0	78	83	0	0	4	3
District of Columbia	0	0	14	13	0	0	0	1
Virginia	1	0	76	32	0	0	3	4
West Virginia	2	1	79	39	4	0	5	4
North Carolina	0	0	76	33	0	1	0	4
South Carolina [3]	0	0	8	4	0	0	4	0
Georgia [3]	0	0	9	14	0	0	10	5
Florida [3]	0	0	7	5	0	0	1	2

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb 3, 1934, and Feb 4, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933	Week ended Feb 3, 1934	Week ended Feb 4, 1933
East South Central States								
Kentucky	0	0	106	48	1	0	1	5
Tennessee	1	0	54	21	0	3	8	10
Alabama [3]	0	0	20	27	0	2	4	4
Mississippi [2]	0	0	32	13	2	0	5	3
West South Central States								
Arkansas	0	1	12	13	1	7	1	1
Louisiana	1	0	26	8	1	0	7	3
Oklahoma [4]	0	0	29	26	0	8	13	0
Texas [3]	0	0	145	72	17	28	17	4
Mountain States								
Montana	0	0	25	26	0	1	1	1
Idaho	0	0	15	6	1	18	0	0
Wyoming	0	0	8	3	5	0	0	0
Colorado	1	0	43	46	11	0	0	1
New Mexico	0	0	34	9	0	0	3	1
Arizona	0	0	1	4	1	0	0	0
Utah [2]	0	0	7	15	1	0	0	0
Pacific States								
Washington	1	0	46	44	0	4	3	1
Oregon	0	0	60	15	7	1	0	2
California	3	1	301	237	13	34	6	12
Total	17	12	6,213	5,929	131	194	144	137

[1] New York City only

[2] Week ended earlier than Saturday

[3] Typhus fever, week ended Feb 3, 1934, 19 cases, as follows South Carolina, 2, Georgia, 9, Florida, 1; Alabama, 5, Texas 2

[4] Exclusive of Oklahoma City and Tulsa

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
December 1933										
Kansas	2	133	4	2	149		2	507	19	10
New Hampshire		2	1					77	0	4
Tennessee	7	225	324	148	830	11	0	488	12	35
Texas	1	1,045	679	4,242		39	5	591		144
January 1934										
Connecticut	2	20	79		60		1	281	0	1
Delaware	1	20	3		195		1	50	0	1
District of Columbia		118	14		576	1	0	70	0	2

December 1933

Chicken pox	Cases
Kansas	894
Tennessee	321
Dysentery:	
Kansas (amoebic)	11
Tennessee	6
German measles	
Kansas	4
Tennessee	15
Hookworm disease:	
Tennessee	2

December 1933—Continued

Impetigo contagiosa	Cases
Kansas	1
Tennessee	9
Lethargic encephalitis.	
Kansas	4
Tennessee	1
Texas	13
Mumps.	
Kansas	178
Tennessee	100

December 1933—Continued

Ophthalmia neonatorum	Cases
Tennessee	4
Paratyphoid fever:	
Kansas	2
Texas	4
Puerperal septicemia:	
Tennessee	1
Scabies.	
Tennessee	34
Septic sore throat:	
Kansas	4
Tennessee	13

December 1933—Continued

	Cases
Tetanus	
Kansas	3
Tennessee	1
Trachoma	
Tennessee	21
Tularaemia	
Kansas	2
Tennessee	2
Undulant fever	
Kansas	10
Tennessee	2
Vincent's infection	
Kansas	1
Tennessee	4
Whooping cough	
Kansas	434
Tennessee	118

January 1934

	Cases
Anthrax	
Delaware	1
Chicken pox	
Connecticut	713
Delaware	43
District of Columbia	86
Conjunctivitis	
Connecticut	48
Dysentery	
Connecticut (amoebic)	1
German measles	
Connecticut	7
Lethargic encephalitis	
Connecticut	4
District of Columbia	2

January 1934—Continued

	Cases
Mumps	
Connecticut	618
Delaware	1
Ophthalmia neonatorum	
Connecticut	3
Rabies in animals	
Connecticut	3
Septic sore throat	
Connecticut	12
Trichinosis	
Connecticut	1
Undulant fever	
Connecticut	1
Whooping cough	
Connecticut	213
Delaware	28
District of Columbia	90

WEEKLY REPORTS FROM CITIES

City reports for week ended Jan 27, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table] Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0		0	0	3	3	0	0	0	9	23
New Hampshire.											
Concord	0		0	16	2	0	0	1	0	0	11
Manchester	0		2	0	3	0	0	1	0	0	16
Nashua	0		0	0	0	3	0	0	0	2	
Vermont											
Barre	0		0	0	0	0	0	0	0	0	4
Burlington	0		0	0	0	4	0	0	0	10	14
Massachusetts.											
Boston	3		0	326	28	66	0	15	1	89	251
Fall River	1		0	0	2	4	0	3	0	1	25
Springfield	0		0	3	1	3	0	0	0	30	29
Worcester	0		0	107	5	10	0	0	0	15	47
Rhode Island											
Pawtucket	1		0	0	0	2	0	0	0	0	0
Providence	2		2	0	9	7	0	0	1	10	73
Connecticut											
Bridgeport	0	1	1	0	1	18	0	1	0	0	38
Hartford	0	1	0	0	4	6	0	0	0	1	49
New Haven	0		0	0	4	3	0	1	0	2	50
New York:											
Buffalo	0		0	206	12	28	0	5	0	21	137
New York	42	25	18	35	173	266	0	88	2	97	1,560
Rochester	0		0	0	6	16	0	1	0	8	75
Syracuse	0		0	1	8	2	0	1	0	41	56
New Jersey											
Camden	1		0	14	4	13	0	0	1	0	31
Newark	0	5	0	3	9	25	0	4	0	23	107
Trenton	0	3	0	2	3	22	0	2	1	6	45
Pennsylvania:											
Philadelphia	1	11	5	664	50	92	0	29	2	61	549
Pittsburgh	10	1	2	8	22	31	0	7	2	56	166
Reading	0		0	12	1	5	0	0	0	14	16
Scranton	0		0	0	0	7	0	0	0	1	
Ohio											
Cincinnati	2		2	237	9	23	0	9	1	32	122
Cleveland	6	45	3	1	19	69	0	11	0	91	194
Columbus	3	6	7	1	9	28	0	2	0	32	99
Toledo	2	4	4	90	5	58	0	1	0	49	66
Indiana											
Fort Wayne	6		0	0	2	9	0	1	0	0	16
Indianapolis	2		2	31	18	8	0	5	0	29	
South Bend	0		0	0	0	5	0	0	0	1	13
Terre Haute	0		0	51	0	2	0	0	0	0	17

City reports for week ended Jan 27, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Illinois											
Chicago	2	5	4	31	47	276	0	41	1	165	708
Springfield	2	4	1	5	9	5	0	0	0	4	25
Michigan											
Detroit	8	2	4	7	30	132	0	20	0	112	270
Flint	2		0	6	3	53	0	1	1	2	26
Grand Rapids	0		2	0	0	11	0	2	0	0	38
Wisconsin											
Kenosha	0		0	0	0	18	0	0	0	6	6
Milwaukee	2		0	5	8	55	0	5	0	116	85
Racine	1		0	2	0	11	0	0	0	3	11
Superior	0		0	1	1	0	0	1	0	1	8
Minnesota											
Duluth	0		0	1	2	0	0	1	2	0	17
Minneapolis	2		1	5	19	17	0	4	2	16	109
St Paul	0		0	0	15	7	0	1	0	10	85
Iowa											
Des Moines	0			1		23	0		0	0	34
Sioux City	2			2		1	0		0	2	
Waterloo	0			0		0	0		0	2	
Missouri											
Kansas City	1		0	1	21	26	0	5	0	9	107
St Joseph	0		0	1	9	2	0	0	0	0	45
St Louis	27	1	1	432	14	24	1	9	2	46	236
North Dakota											
Fargo	0		0	103	0	0	0	0	0	2	1
Grand Forks	0		0	1	0	0	0	0	0	1	
South Dakota											
Aberdeen	0		0	0	0	0	0	0	0	0	
Sioux Falls	0		0	36	0	0	0	0	0	0	8
Nebraska											
Omaha	1		0	74	12	10	0	1	0	16	60
Kansas											
Topeka	0		0	0	5	8	0	1	0	5	28
Wichita	1		0	0	2	3	0	0	0	12	24
Delaware											
Wilmington	0		0	15	7	7	0	1	0	3	37
Maryland											
Baltimore	2	6	3	25	23	43	0	9	0	155	242
Cumberland	2		1	4	0	0	0	0	0	0	14
Frederick	0		0	0	0	0	0	0	0	0	5
District of Columbia											
Washington	11	5	2	156	16	18	0	14	0	23	179
Virginia											
Lynchburg	0		0	0	2	2	0	1	0	0	15
Richmond	0	1	1	2	4	9	0	4	0	1	60
Roanoke	0		0	1	1	3	0	2	0	1	21
West Virginia											
Charleston	2		0	0	2	0	0	0	0	0	22
Huntington	0		0	1	0	6	1	0	0	0	
Wheeling	0		0	0	4	6	0	1	0	15	21
North Carolina											
Raleigh	0		0	7	1	3	0	0	0	1	12
Wilmington	3		0	0	2	0	0	1	0	4	17
Winston-Salem	4		0	216	2	1	0	0	1	0	16
South Carolina											
Charleston	0	50	1	12	6	1	0	0	0	9	26
Columbia											
Greenville	0		0	0	3	0	0	0	0	0	17
Georgia											
Atlanta	7	34	3	102	15	2	0	4	0	5	100
Brunswick	0	1	1	46	0	0	0	0	0	3	3
Savannah	1	26	3	56	2	1	0	2	0	1	37
Florida											
Miami	6	2	0	0	3	3	0	1	1	1	30
Tampa	3	4	4	1	4	1	0	1	0	0	30
Kentucky											
Ashland	0			0		0	0		0	0	
Lexington	5		0	0	2	1	0	2	0	8	18
Louisville	6	1	0	0	15	33	0	3	0	18	76
Tennessee											
Memphis	1		1	118	19	8	0	5	1	14	106
Nashville	0		3	110	4	9	0	5	1	6	51
Alabama											
Birmingham	4	5	3	4	5	4	0	7	0	11	82
Mobile	1		1	6	1	0	0	3	0	0	33
Montgomery	2			1		0	0		0	4	

City reports for week ended Jan 27, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Arkansas											
Fort Smith	0	------	------	27	------	0	0	------	0	0	------
Little Rock	0	------	0	28	6	2	1	1	0	0	7
Louisiana											
New Orleans	17	6	7	10	12	22	0	13	3	0	169
Shreveport	0	------	0	1	4	5	0	1	0	2	40
Oklahoma											
Tulsa	2	------	------	8	------	1	0	------	0	0	------
Texas											
Dallas	13	------	0	0	7	8	0	2	4	5	62
Fort Worth	5	------	0	0	3	8	0	0	1	2	36
Galveston	3	------	0	0	2	3	0	1	0	0	13
Houston	15	------	0	1	9	4	0	2	0	0	74
San Antonio	3	------	4	1	10	13	0	5	0	0	68
Montana											
Billings	0	------	0	0	0	0	0	0	0	0	6
Great Falls	0	------	0	2	1	0	0	1	0	0	10
Helena	0	------	0	0	0	0	0	0	0	0	3
Missoula	0	1	1	0	0	2	0	0	0	0	3
Idaho											
Boise	0	------	0	0	0	0	0	1	0	0	12
Colorado											
Denver	2	17	0	3	10	12	1	7	0	60	87
New Mexico											
Albuquerque	0	------	0	1	3	2	0	4	1	2	11
Utah											
Salt Lake City	0	------	1	631	4	9	0	1	0	37	43
Nevada											
Reno	0	------	0	0	0	2	0	0	0	0	1
Washington											
Seattle	0	------	3	3	6	15	0	2	1	78	92
Spokane	0	------	------	315	1	4	1	------	0	8	32
Tacoma	0	------	0	0	7	0	0	0	0	21	34
Oregon											
Portland	0	1	0	5	5	19	0	0	0	1	55
Salem	0	------	0	1	0	0	0	0	0	2	------
California											
Los Angeles	16	20	1	17	23	88	0	28	2	52	308
Sacramento	0	------	1	0	2	5	0	1	0	4	21
San Francisco	2	3	1	9	10	18	0	15	0	25	185

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts:				Missouri			
Boston	0	0	1	Kansas City	1	0	0
New York				Maryland			
New York	1	1	0	Baltimore	1	0	0
Pennsylvania.				West Virginia			
Philadelphia	2	2	0	Wheeling	0	0	1
Ohio:				Georgia			
Cleveland	0	1	0	Atlanta	1	1	0
Indiana				Tennessee			
South Bend	2	1	0	Memphis	1	2	0
Illinois				California			
Chicago	9	3	0	Los Angeles	2	1	1
Wisconsin.				Sacramento	0	0	1
Milwaukee	0	0	1				

Lethargic encephalitis.—Cases Boston, 2, Philadelphia, 1, Pittsburgh, 1, Toledo, 1, Detroit, 1, St. Louis, 1, Washington, 1; Sacramento, 2

Pellagra.—Cases Washington, 1, Raleigh, 2, Charleston, S C, 1, Atlanta, 3, Savannah, 3, Memphis, 2, New Orleans, 1, Los Angeles, 1

Typhus fever.—Cases Savannah, 2, Tampa, 1 Deaths. Savannah, 1

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended January 13, 1934.—During the 2 weeks ended January 13, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, for seven Provinces, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Alberta	British Columbia	Total
Chicken pox		9		401	569	26	135	1,140
Diphtheria		8	3	43	7			61
Erysipelas				13	3	1		17
Influenza		14		6	15		54	89
Measles		25		60	66	6	4	161
Mumps					233	1	146	380
Paratyphoid fever					1			1
Pneumonia		3			37		30	70
Poliomyelitis					1			1
Scarlet fever		19	4	155	231	8	135	555
Trachoma							1	1
Tuberculosis	2	2	12	103	50	5	22	196
Typhoid fever			13	26	19		1	59
Undulant fever					3			3
Whooping cough		42	1	173	125	3	19	363

NOTE —No reports were received from Manitoba and Saskatchewan for the above period

Quebec Province—Communicable diseases—2 weeks ended January 27, 1934.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended January 27, 1934, as follows.

Disease	Cases	Disease	Cases
Chicken pox	397	Poliomyelitis	1
Diphtheria	36	Puerperal septicemia	2
Erysipelas	15	Scarlet fever	179
German measles	12	Tuberculosis	121
Influenza	13	Typhoid fever	31
Measles	39	Undulant fever	2
Ophthalmia neonatorum	2	Whooping cough	372

CUBA

Habana—Communicable diseases—4 weeks ended January 27, 1934—During the 4 weeks ended January 27, 1934, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	4		Tuberculosis	17	
Malaria	7	1	Typhoid fever	2	2

PANAMA CANAL ZONE

Communicable diseases—October–December 1933—During the months of October, November, and December 1933, certain communicable diseases were reported in the Panama Canal Zone and terminal cities, as follows:

Disease	October		November		December	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Chicken pox	6		10		21	
Diphtheria	13		6		10	1
Dysentery (amoebic)	27	2	43	1	58	3
Dysentery (bacillary)					1	1
Leprosy			1			
Lethargic encephalitis			1			
Malaria	142	6	87	2	101	3
Measles	14		7		9	
Meningococcus meningitis			1	1		
Pneumonia		11		26		29
Poliomyelitis			3			
Relapsing fever			1			
Trachoma			1			
Tuberculosis		34		27		34
Typhoid fever	2	1	4		3	1
Typhus fever	1					
Whooping cough	6		4		12	

PUERTO RICO

Notifiable diseases—4 weeks ended January 27, 1934—During the 4 weeks ended January 27, 1934, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico, as follows.

Disease	Cases	Disease	Cases
Chicken pox	12	Paratyphoid fever	1
Diphtheria	34	Ringworm	4
Dysentery	140	Scarlet fever	1
Erysipelas	5	Syphilis	21
Filariasis	3	Tetanus	2
Framboesia	1	Tetanus, infantile	1
Influenza	69	Trachoma	26
Malaria	[1] 10,495	Tuberculosis	501
Measles	45	Typhoid fever	29
Mumps	30	Whooping cough	328
Ophthalmia neonatorum	3		

[1] Includes results from a special survey

YUGOSLAVIA

Communicable diseases—December 1933.—During the month of December 1933, certain communicable diseases were reported in Yugoslavia, as follows

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	34	9	Paratyphoid fever	8	
Cerebrospinal meningitis	4	2	Scarlet fever	505	38
Diphtheria and croup	963	135	Sepsis	10	4
Dysentery	44	8	Tetanus	21	10
Erysipelas	191	8	Typhoid fever	258	35
Measles	701	7	Typhus fever	66	2

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Jan 26, 1934, pp 128-139 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Feb 23, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands.—During the week ended February 3, 1934, cholera was reported in the Philippine Islands as follows Bohol Province—Antequera, 3 cases, 2 deaths, Balilihan, 2 cases, 1 death; Calape, 1 case, 1 death; Clarin, 3 cases, 3 deaths; Cortes, 4 cases, 4 deaths, Inabanga, 2 cases, 2 deaths, Loon, 2 cases, 1 death, Talibon, 5 cases, 2 deaths, Tubigon, 8 cases, 5 deaths Cebu Province—Cebu City, 1 case, 1 death Oriental Negros Province—Ayuquitan, 2 cases, 2 deaths, Bais, 4 cases, 2 deaths, Tanjay, 7 cases, 6 deaths.

Smallpox

China—Manchuria.—A report dated February 3, 1934, states that 300 cases of smallpox with 100 deaths have occurred in Dairen, Manchuria since November 1933, and at the time of the report there were about 100 cases of smallpox. Local authorities are endeavoring to enforce compulsory vaccination.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 8

FEBRUARY 23 - - 1934

IN THIS ISSUE

The Standardization of Vibrion Septique Antitoxin
Death Rates for a Group of Insured Persons, 1933
Cities with Milk-Sanitation Ratings of 90% or More
Deaths in Large Cities During Week Ended February 3
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93, title 44, section 220

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

	Page
Studies on the standardization of Vibrion septique antitoxin	251
Death rates for a large group of insured persons, 1933	262
Milk-sanitation ratings of cities—Cities for which milk-sanitation ratings of 90 percent or more were reported by State milk-sanitation authorities during the month of January 1934	266
Court decision on public health	266
Deaths during week ended February 3, 1934.	
Deaths and death rates for a group of large cities in the the United States	267
Death claims reported by insurance companies	267
PREVALENCE OF DISEASE	
United States:	
Current weekly State reports	
Reports for weeks ended February 10, 1934, and February 11, 1933	268
Summary of monthly reports from States	270
Weekly reports from cities	
City reports for week ended February 3, 1934	271
Foreign and insular.	
Canada	
Provinces—Communicable diseases—2 weeks ended January 27, 1934	274
Ontario Province—Communicable diseases—Years 1933 and 1932, comparative	274
Jamaica—Communicable diseases—4 weeks ended January 27, 1934	275
Cholera, plague, smallpox, typhus fever, and yellow fever:	
Cholera	276
Plague	278
Smallpox	280
Typhus fever	285
Yellow fever	287

PUBLIC HEALTH REPORTS

VOL. 49 FEBRUARY 23, 1934 No. 8

STUDIES ON THE STANDARDIZATION OF VIBRION SEPTIQUE ANTITOXIN

By IDA A. BENGTSON, *Senior Bacteriologist, National Institute of Health, United States Public Health Service*

The increased production and use of gas gangrene antitoxins in late years have made desirable the establishment of standards and units of measurement for determining the potency of these products The American unit for *perfringens* antitoxin was accepted for international use at the meeting of the Permanent Commission on Biological Standardization of the Health Organization of the League of Nations in June 1931. At the same meeting the Commission recommended "that the possibility be explored of obtaining international agreement on the adoption of a standard preparation and unit for gas-gangrene (*Vibrion septique*) antitoxin" The work here reported is a contribution toward that end and has involved (1) the preparation of dried toxin and antitoxin which may be used as standards in this country, (2) a comparison of these with the toxins and antitoxins of other countries, and (3) the testing of some of the commercial antitoxins produced in this country

The antitoxins produced in this country by the biological establishments are usually the combined "tetanus-gas gangrene" antitoxin, intended as a prophylactic agent, which contains tetanus, *perfringens*, and *Vibrion septique* antitoxins and the "gas gangrene" antitoxin intended for curative purposes containing antitoxins against *Cl perfringens* and *Vibrion septique* and sometimes against some of the other anaerobes concerned in gas gangrene

These antitoxins have been used in a number of conditions in which the organisms of gas gangrene may occur, such as lacerated wounds, gunshot wounds, operative wounds, and compound fractures. During recent years the combined serum has been used to some extent in cases of gangrenous appendix, peritonitis, and intestinal obstruction and also in puerperal infections. In 200 cases of acute appendicitis studied by Weinberg, Prévot, Davesne, and

Renard (1), *Cl perfringens* was found in 30 percent of the cases, and *Vibrion septique* and *Cl histolyticus* were found in some of these

A definite clinical evaluation of these antitoxins cannot be made at the present time They probably should not be considered in the same category with tetanus and diphtheria antitoxins The organisms of gas gangrene are invasive, in contrast to those of tetanus and diphtheria On the other hand, they produce much less potent toxins The recent work of Robertson and Felix (2) suggests that serums against *Vibrion septique* infections should be antibacterial as well as antitoxic. They produced an immune serum in a horse by intravenous injection with somatic antigen which was completely nonantitoxic, but which protected against infection by washed spores activated by means of $CaCl_2$ On the contrary, Craddock and Parish (3) reached the conclusion that *Vibrion septique* antitoxin confers complete protection against massive doses of living culture as well as against activated spores

METHODS OF STANDARDIZING THE ANTITOXIN

Weinberg, Davesne, and Prévot originally based their unit of antitoxin on the amount which neutralized one minimal lethal dose of toxin in a rabbit weighing about 2,000 g On this basis, a serum of which 1/1,000 cc protected against one minimal lethal dose contained 1,000 units In 1932 these investigators determined the comparative strength of the test dose of toxin in rabbits and mice. The minimal lethal dose of a toxin fatal for rabbits in doses of 4.5 mg was equivalent to 15 minimal lethal doses in mice

Glenny, Llewellyn-Jones, and Mason (5) proposed a provisional unit ascertained by intravenous inoculation of mice. In determining the test dose of toxin, a dilution of toxin containing as many fatal doses as possible in a conveniently small volume was chosen, and the amount was titrated against an arbitrarily selected antitoxin. It was found that 0.02 cc of the antitoxin just neutralized the test dose of 4 mg of dried toxin contained in 0.2 cc of saline (approximately 20 M.L D.'s of the particular toxin used) when the mixture was inoculated into mice. This amount, 0.02 cc, of the antitoxin was therefore considered the unit.

Sordelli, Ferrari, and Mayer (6) favor the use of guinea pigs and found results more uniform in this species than in the white mouse. Using both the intravenous and the intramuscular routes of inoculation they found the M.L.D. to be approximately 2.5 mg by the intravenous and 3 mg by the intramuscular route The test dose of toxin was fixed provisionally at 20 mg, corresponding to a little more than 5 M.L.D.'s. A test serum was titrated against this amount of toxin and the unit fixed as the largest amount of the serum which

did not neutralize the test dose of toxin in guinea pigs inoculated intramuscularly, 2 days being allowed as the time limit of the test.

Schlingman (7) used the rabbit as the test animal practicing the intravenous method of inoculation The rabbit offers the advantage of easy inoculation by this route and is more susceptible to the action of the toxin than other species of laboratory animals The unit of antitoxin was established as that quantity of serum which would neutralize 100 minimal lethal doses of toxin per kilogram of body weight The test dose of toxin was fixed as the smallest amount of toxin which when mixed with one-tenth unit of antitoxin and injected intravenously would cause death of the rabbit within 24 hours. In testing a serum of unknown potency, varying amounts of the serum were titrated against the test dose of toxin. The smallest amount of antitoxin per kilogram of rabbit which would protect against the test dose of toxin was considered to contain one tenth unit. The unit proposed by Schlingman was later divided by 100.

EXPERIMENTAL

Preliminary to the work on the standardization studies of the antitoxin a cultural and serological study was made of a collection of 66 cultures of *Vibrion septique*.[1] Morphologically and culturally all the strains studied were typical *Vibrion septique* as described by Miss Muriel Robertson (8) The organism is more slender than *Cl. welchii* and readily forms spores, which are oval and usually subterminal. When occurring in the tissues, *Vibrion septique* is characterized by filamentous forms and by bulbous shapes described as "citron" or "navicular." In meat medium there is no proteolysis or blackening of the medium There is a slight odor, which is not putrefactive. In addition to the carbohydrates usually listed as being fermented by *Vibrion septique*, viz, glucose, levulose, galactose, maltose, and salicin, the following were also fermented: mannose, trehalose, dextrin, and starch. There was slight or definite fermentation of inosite and slight fermentation of amygdalin by most of the strains

All the strains were tested for toxin production by intraperitoneal inoculation of mice, and all caused death in doses varying from 0 01 to 0.5 cc of a 48-hour broth culture. A *Vibrion septique* antitoxin protected mice against the toxins of all the cultures. As has been pointed out by others, it is probably true that all strains of *Vibrion septique* produce toxin and that they do not lose this property.

---

[1] The writer is greatly indebted to Dr Hilda Hempl Heller for her entire collection of *Vibrion septique* cultures, including cultures from 7 States in the United States, 13 cultures from the Western Front, and cultures from Denmark, France, Germany, Italy, Norway, and Switzerland These were obtained from the following sources: man, cattle, sheep, hog, horse, guinea pig, goat, whale, soil The remaining cultures were obtained from Dr. Weinberg, the Pasteur Institute, the National collection of type cultures of Great Britain, and the Parke, Davis and Lederle biological establishments.

Toxin – A broth medium (beef infusion) adjusted to a reaction of pH 7 6 was prepared in 4-liter Erlenmyer flasks for use in the production of toxin Prior to use, the medium was heated in the Arnold sterilizer to expel air, then cooled to 40° C., after which 2 percent of sterile horse serum was added Incubation was carried out at 37° C. for 48 hours The culture was then filtered through a Mandler filter. The filtrate was treated with ammonium sulphate in the proportion of 750 g of ammonium sulphate to each liter of filtrate The toxin was thus agglomerated in small floccules, which rose to the surface. It was dried *in vacuo* over P_2O_5 and then placed in a ball mill and ground to an impalpable powder The yield of toxin was 207 g from 44 liters of filtrate Amber-colored U-tubes were used as containers, with the toxin in one arm and P_2O_5 in the other The air was exhausted and the tubes were sealed under vacuum and stored in the dark at a temperature of 5° C

Antitoxin –The serum to be used for the standard antitoxin was obtained from Parke, Davis & Co It was a concentrated serum of rather high potency. It was measured in 10 cc amounts into pyrex glass ampoules of about 30 cc capacity. The serum was dried *in vacuo* over P_2O_5, after which an agglutination tube containing P_2O_5 was placed in each vial The vials were filled with nitrogen, then sealed and stored in the dark at a temperature of 5° C. When needed for use, the dried serum was diluted with a mixture of 1 part of physiological salt solution and 2 parts of glycerin to the desired amount. The dried antitoxin was in clear flakes which dissolved readily in salt solution

Minimal lethal dose of toxin.– A number of tests were made on various animals to determine the minimal lethal dose by different routes. Through the intravenous inoculation of animals seemed to be the method of choice, the effect of subcutaneous and intramuscular inoculations of rabbits and guinea pigs was of special interest in view of the fact that Sordelli uses intramuscular inoculation for testing the potency of his antitoxins. However, the results obtained in all tests were not such as to be favorable for adaptation to the potency testing of serums Large doses were required to produce death, and the results were irregular. It was necessary to use doses as high as 20 mg per kilogram in rabbits to cause death when inoculated intramuscularly. Guinea pigs were found to be resistant to doses as high as 15.6 mg when injected intramuscularly. Apparently the toxin is absorbed very slowly when introduced by the intramuscular or subcutaneous routes. It is difficult to understand Sordelli's success in the use of the intramuscular method of inoculation.

In contrast with the indeterminate results with subcutaneous and intramuscular inoculations, the intravenous method produced striking

results, particularly in rabbits. This species is highly sensitive to the action of the toxin by this route; and with somewhat over 1 minimal lethal dose, symptoms occurred and death supervened sometimes in as short a period as 2 or 3 minutes. The minimal lethal dose by this route was 1 3 mg per kilogram weight of rabbit and 0 16 mg for mice weighing approximately 20 g On the basis of weight, the rabbit is therefore about 6 times as sensitive as the white mouse.

TESTS TO DETERMINE STANDARDS OF TOXIN AND ANTITOXIN

On the basis of sensitivity it would seem that the rabbit might be the most desirable animal for test purposes A dose of 10 minimal lethal doses of toxin per kilogram was arbitrarily chosen as a test dose and the amount of antitoxin which just failed to neutralize this as the unit for measuring the potency of antitoxins It was thought that a dose of toxin as large as 10 M L.D's might be sufficient to insure titrations accurate within 10 percent Rabbits in groups of 4 were inoculated with 13 mg (10 M.L D's) of toxin per kilogram mixed with varying amounts of the antitoxin which had been selected for the standard [2] The results of two tests are shown in table 1.

TABLE 1 —*Results of tests on rabbits to determine strength of antitoxin*

TEST 1

Number of rabbits	Toxin per kilogram	Antitoxin per kilogram	Number dying	Number surviving
	Mg	*Cc*		
4	13	0 0020	1 (37 hours)	3
4	13	0018	3 (6, 6, 25 hours)	1
4	13	0016	4 (½, 1, 1, 6 hours)	0
4	13	0014	4 (less than ½ hour)	0

TEST 2

4	13	0 0024	0	4
4	13	0022	1 (12 hours)	3
4	13	0020	2 (4, 11 hours)	2
4	13	.0018	3 (29, 72, 72 hours)	1
4	13	0016	4 (3, 3, 5, 7, hours)	0
4	13	0014	4 (⅙, ¼, 3, 3 hours)	0

The doses of antitoxin are spaced at approximately 10-percent intervals figuring from the highest dose. In the first test, one of the rabbits on a dose of 0.0020 cc died. This amount is 25 percent over the dose on which all 4 rabbits died. In the second test one of the rabbits on a dose of 0.0022 cc died, and this dose is 35 percent over that which was fatal to all 4 rabbits.

In 4 tests (table 2) 15 of the 16 rabbits on the dose of 0 0016 cc of the antitoxin died in 24 hours or less. The tests therefore indicate that, while the amount of antitoxin (0.0016 cc) which just fails to

[2] The tests on rabbits were made with the standard serum before drying.

neutralize the test dose of toxin allowing none of the 4 rabbits to survive, can be fixed quite satisfactorily, allowing a time limit of 24 hours, the amount of antitoxin which protects all 4 rabbits against the toxin is less definite and quite far removed from the nonprotective dose If the rabbit is used as the test animal it would seem necessary, therefore, to use as the test dose of antitoxin the amount which fails to protect practically all of the animals rather than an amount which is fatal to some while allowing others to survive

TABLE 2—*Results of tests in rabbits to determine the largest amount of antitoxin which fails to protect*

Number of rabbits	Toxin per kilogram	Antitoxin per kilogram	Number dying	Number surviving
	Mg	*Cc*		
4	13	0 0016	3 (½, 7, 22 hours)	1
4	13	0016	4 (½, 1, 1, 6 hours)	0
4	13	0016	4 (3, 3, 5, 7 hours)	0
4	13	0016	4 (2, 2, 19, 25 hours)	0

Tests on mice.—Following the League of Nations method for testing *perfringens* antitoxin, tests were carried out on mice, using the intravenous route of inoculation. Groups of six mice each were used for these tests. In order to obtain a comparison between the results in rabbits and mice, proportionate amounts of antitoxin were used. The antitoxin was considered the fixed quantity and the smallest amount of toxin which failed to be neutralized by the dose of antitoxin used was determined. In these tests the dried serum was diluted to the desired strengths. Amounts of antitoxin corresponding to one half and one fourth the 0 0016 cc dose were used

TABLE 3.—*Results of a test on mice using 0 0008 cc of antitoxin and doses of toxin spaced at 10 percent intervals*

Milligrams of toxin	M L D.'s	Number of mice	Number dying	Number surviving
4	25	6	0	[1] 6
4 5	28	6	2	4
5	31	6	6	[2] 0
5 5	36	6	6	0

[1] Lo dose [2] L+ dose

With differences of approximately 10 percent in the amounts of toxin a definite end point was obtained as shown in table 3. All of the mice on a dose of 5 mg died within 48 hours, 2 on dose of 4.5 mg died, and none on 4 mg died. The difference between the L+ and the Lo dose was therefore 1 mg, which is approximately 6 M.L.D.'s. In this test the amount of antitoxin used was half that used in rabbits, i.e., 0.0008 cc, and this amount was contained in 0.5 cc. This

necessitated diluting the toxin 1 to 50 instead of 1 to 100 in order that the volume of the mixture should not be too large for the size of the mouse.

Tests were then carried out using amounts of toxin spaced at approximately 5 percent intervals figuring from the smallest dose. In these tests one fourth the amount of antitoxin used in the rabbit tests was used, and the doses of toxin range from 2 1 to 2.6 mg per mouse. In this way the toxin could be diluted 1 to 100 and the volume of the mixture kept within 0.6 cc. The results of triplicate tests are shown in table 4.

TABLE 4 —*Results of tests on mice using 0 0004 cc of antitoxin and doses of toxin spaced at 5 percent intervals (72 hours time limit)*

Milligrams of toxin	M.L D 's	Test 1			Test 2			Test 3		
		Number	Died	Survived	Number	Died	Survived	Number	Died	Survived
2.2	13 8	6	0	6	6	0	6	6	0	6
2 3	14.4	6	0	6	5	1	5	5	0	[1] 6
2 4	15	6	3	3	6	4	2	6	2	4
2 5	15 6	6	5	1	6	5	1	6	4	2
2 6	16.3	--------	--------	--------	6	6	0	6	6	[2] 0

[1] Lo dose.
[2] L+ dose

All mice except one on a dose of 2.3 mg survived, and all on the dose of 2.6 mg died. The difference between the Lo and the L+ dose was 0 3 mg, which is approximately 2 minimal lethal doses. The test dose of toxin may then be established as a dose of toxin lying between the Lo and the L+ dose, i.e , on a dose which is fatal to some mice while allowing others to survive. As indicated by the tests, 2.5 mg may be considered a suitable test dose of toxin. The amount of antitoxin used against this dose of toxin was 0.0004 cc, and this amount may therefore be used as the basis for the provisional unit of antitoxin. As will be brought out in the following paragraphs, 4 times this dose, or 0.0016 cc, proved to be a desirable unit. The dried serum was so diluted with glycerin and salt solution that 1 cc contained 50 units on this basis.

It may be concluded from a comparison of the results obtained in rabbits and mice that, while the rabbit may be employed as the test animal if a dose of toxin sufficiently large to be fatal to all the rabbits in 24 hours is used as the test dose, more satisfactory results are obtained with mice.

The uniformity of the results obtained with the test dose of toxin in mice is shown in table 5. In all the tests there were some survivals and some deaths. (The ideal division would of course be 3 survivals and 3 deaths.)

TABLE 5.—*Uniformity of results with the test dose of toxin in mice*

Date	Standard glycerinated antitoxin diluted 1:50	Toxin diluted 1:100	Number of mice inoculated	Number of mice dying within 72 hours	Number of mice surviving
	Cc	Cc			
Nov. 28, 1932	0.25	0.25	6	5	1
Nov. 30, 1932	.25	.25	6	4	2
Dec. 5, 1932	.25	.25	6	4	2
Dec. 19, 1932	.25	.25	6	1	5
Dec. 20, 1932	.25	.25	6	2	4
Dec. 22, 1932	.25	.25	6	5	1
Jan. 3, 1933	.25	.25	6	5	1
Jan. 6, 1933	.25	.25	6	2	4
Jan. 10, 1933	.25	.25	6	4	2
Jan. 11, 1933	.25	.25	6	2	4
Jan. 21, 1933	.25	.25	6	4	2
Jan. 23, 1933	.25	.25	6	4	2
Jan. 27, 1933	.25	.25	6	4	2
Jan. 28, 1933	.25	.25	6	2	4
Jan. 30, 1933	.25	.25	6	4	2
Feb. 2, 1933	.25	.25	6	4	2
Feb. 3, 1933	.25	.25	6	1	5

TITRATION OF PROPOSED STANDARD SERUMS OF OTHER COUNTRIES

Tests were made to determine the strength of the French standard supplied by Dr. Weinberg and the standard of Sordelli, of the Argentine Republic. The British standard serum was not available for test; but a statement received from Dr. Hartley, of the National Institute for Medical Research, indicates that 0.0016 cc of our standard is approximately 2.3 times the amount which the British are considering as their provisional unit.

The French unit was received in glycerinated form and diluted to contain 100 units per cc. The amount of our standard, 0.0016 cc, was found to be about 4.4 times as large as the French unit.

The unit of the Argentine Republic as expressed by Sordelli is 1 cc of his glycerolated serum diluted with 4 cc of salt solution. The test is carried out by intramuscular inoculation of guinea pigs. The test dose of toxin used by Sordelli is about 5 minimal lethal doses for a guinea pig. In our tests on mice, 0.25 cc of the 1 to 5 dilution of the antitoxin was found to protect against 3 minimal lethal doses of toxin but not against 4.5 minimal lethal doses. On this basis approximately 3.7 cc of the 1 to 5 dilution of the antitoxin is equivalent to our proposed unit. Our unit would therefore be approximately 3.7 times that of the Argentine Republic.

TITRATION OF COMMERCIAL SERUMS

Several commercial serums (A–D) were tested using the mouse test as described. All of these were combined serums labelled to contain 1,500 units of tetanus antitoxin, 1,000 units of *perfringens* antitoxin, and 1,000 units of *Vibrion septique* antitoxin. An illustration of a test is shown in table 6.

TABLE 6.—*Sample protocol of a test in mice to determine the potency of a commercial serum (Serum D)*

	Antitoxin		Toxin (1:100 dilution)	Result	
	Amount	Dilution			
	Cc		Cc		
I	0.25	1:100	0.25	Survived	
	.25	1:200	.25	Survived.	
	.25	1:300	.25	Survived	
	.25	1:400	.25	Survived	
	.25	1:500	.25	Survived	
	.25	1:600	.25	Survived	
	.25	1:700	.25	Died	
	.25	1:800	.25	Died	
				Died	Survived
II	.34	1:650	.25	0	2
	.30	1:650	.25	0	2
	.27	1:650	.25	1	1
	.24	1:650	.25	2	0
	.21	1:650	.25	2	0
III	.31	1:650	.25	0	6
	.29	1:650	.25	0	6
	.27	1:650	.25	2	4
	.25	1:650	.25	4	2
	.23	1:650	.25	6	0
Control (standard glycerinated antitoxin)	.25	1:50	.25	4	2

$\frac{25}{100}\times\frac{1}{650}\times 4 = 1$ unit. $\frac{1}{650}$ cc $= 1$ unit. 1 cc contains 650 units.

Expressed in terms of 0.0016 cc, or 1 unit of the standard glycerinated serum of our standard serum, serum A contained 100 units, serum B 250 units, serum C 121 units, and serum D 650 units. The potency of these serums expressed in terms of the various proposed units is shown in table 7.

TABLE 7.—*Potency of commercial serums expressed in terms of different units*

(a) UNITS PER CUBIC CENTIMETER

Serum	Ratio of proposed units			
	American 1	British 1 to 2.3	French 1 to 4.4	Argentine 1 to 3.7
A	100	230	440	370
B	250	575	1,100	925
C	121	278	532	448
D	650	1,495	2,860	2,405

(b) UNITS IN TOTAL VOLUME

A, 4 cc	400	920	1,760	1,480
B, 5.9 cc	1,475	3,393	6,490	5,458
C, 5.8 cc	702	1,614	3,088	2,597
D, 4.9 cc	3,185	7,326	14,014	11,785

The results of the tests indicate that the amount under consideration as our provisional unit is probably not too large. Serum D expressed in terms of the other units would have a potency which would seem rather high.

TEST DOSE OF OTHER TOXINS IN MICE

In table 8 is shown the results of titrations to determine the test dose of various toxins received against one fourth of the provisional unit under consideration.

TABLE 8—*The results of titrations to determine the test dose of various toxins against ¼ the provisional unit (0 25 cc of a 1 50 dilution of the standard antitoxin glycerinated)*

	Mg
National Institute of Health, U S A , toxin A	2 5
National Institute for Medical Research, Great Britain, toxin V S VI	.8
Pasteur Institute, toxin "dose test 5 m 8"	5
Argentine Republic	7 4
Wellcome Research Laboratory, batch E	2 1
Great Britain NN1OST	4 1
Parke, Davis no 094757	1 2

The protocol of the test to determine the test dose of the Parke, Davis toxin no. 094757 is shown in table 9 Preliminary tests had shown the dose to lie between 1 and 1.5 mg.

TABLE 9—*Results of a test to determine the test dose of toxin no 094757*

Standard glycerinated antitoxin diluted 1 50	Toxin diluted 1 100	Number of mice dying	Number of mice surviving
Cc	*Cc*		
0 25	0 10	0	6
25	11	0	6
25	12	5	1
25	13	6	0
25	14	6	0
25	15	6	0
25	[1] 25	4	2

[1] Standard

The most suitable toxin for the test is one which is readily soluble in salt solution and of such strength that a sufficiently high concentration is contained in a volume not exceeding 0.3 to 0.4 cc. A total volume of 0 5 cc of the mixture of toxin and antitoxin is a suitable dose, though amounts up to 0.7 cc and 0.8 cc have been used apparently without deleterious effect.

Our own toxin was readily soluble, the solution being only slightly turbid. It was of such strength that a suitable volume of a 1 to 100 dilution could be tested against one fourth the unit under consideration. Other toxins of the same order were the Wellcome Research Laboratory toxin batch E, and the British toxin NN1OST. The French toxin and the Argentine Republic toxin were tested in dilutions of 1 to 50. The French toxin was very readily soluble, a perfectly clear fluid resulting. The Argentine Republic toxin dissolved easily, but a heavy precipitate settled on standing. This could, however, be easily suspended by shaking The other two toxins, the British toxin V.S. VI and the Parke, Davis toxin were stronger, and with these

it would have been possible to carry out the test against one half unit instead of against one fourth. This is an advantage, as the test dose would contain approximately twice as many minimal lethal doses, which would make for greater accuracy in the test The Parke, Davis was a satisfactory toxin, as it was readily soluble and of quite high potency. Some precipitate formed on standing, but this could be easily shaken into suspension The British toxin V S. VI was of nearly twice this strength, but difficultly soluble This interferred with the test to the extent that our results showed a test dose of 1.6 mg against one half our unit instead of a test dose of 1 3 mg as labeled.

RELATIONSHIP OF TEST DOSE OF TOXIN TO THE LETHAL DOSE

The minimal lethal dose of three toxins was determined and information was received in regard to a fourth from Dr Hartley The relationship of the test dose of toxin against one fourth the proposed unit of antitoxin to the minimal lethal dose is shown in table 10. In the case of two toxins, the test dose contained approximately 15 to 16 minimal lethal doses, another contained 12 3, and another 10 minimal lethal doses.

TABLE 10.—*Relationship of test dose of toxins against ¼ the proposed unit of antitoxin to the minimal lethal dose*

Toxin	Test dose against ¼ unit antitoxin	M L D of toxin	Number of M L D 's in test dose
	Mg	*Mg*	
American	2 5	0 16	15 6
British V S VI	65	04	16
Wellcome Research, batch E	2 1	17	12 3
Parke, Davis no 004757	1.2	12	10

SUMMARY

1. A standard antitoxin and a standard toxin have been prepared for use in determining the potency of *Vibrion septique* antitoxins.

2. The method of the intravenous inoculation of mice has been shown to be superior to that of the intravenous inoculation of rabbits.

3. Titrations accurate for differences of less than 10 percent have been obtained in the mouse test.

4. The relationship of the proposed antitoxin standards of other countries to the American proposed provisional standard was determined. The American unit under consideration was found to be 2.3 times the British proposed provisional unit, 4 4 times the French, and 8.7 times that of the Argentine Republic.

5. Titrations of four commercial American antitoxins indicated that the American provisional unit under consideration was of a size which might be considered suitable for expressing the potency of these antitoxins.

6. The test dose of the standard toxin against one fourth the unit of antitoxin under consideration was 2.5 mg. The test doses of other toxins against this same amount of antitoxin ranged from 0.8 to 7.4 mg.

7. In tests to determine the relationship of the test dose of toxin to the minimal lethal dose, it was found that in 2 of 4 toxins the test dose against one fourth the unit of antitoxin was approximately 15 to 16 minimal lethal doses, in one 12.3, and in another 10 minimal lethal doses.

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DEATH RATES FOR A LARGE GROUP OF INSURED PERSONS, 1933

In a summary of mortality records for several million insured persons (industrial policyholders) in the United States and Canada,[1] the Metropolitan Life Insurance Co. points out that 1933 was an excellent health year for the group of persons under study. Although the crude death rate for this insured group was 8.40 per 1,000, as compared with the previous minimum of 8.35[2] in 1932, the adjusted, or standardized, rate, allowing for change in the age composition during the last 2 years, is only 8.02 per 1,000 for ages 1 to 74, as compared with 8.13 for 1932. It is pointed out that early mortality figures for States and the Bureau of the Census figures for 85 large cities also bear evidence that 1933 was an excellent health year, so far as mortality can be used as a health index.

Mortality by age.—The year marked a continued decline in the death rate of children and adolescents, and at most of the childhood ages new rates were recorded in this group. At ages 1 to 4 the death rate in 1933 among white children was less than one third of the 1911 rate, and among colored children, one fourth the earlier figure. The declines in later childhood and adolescence are only a little less than

[1] Statistical Bulletin for January 1934.
[2] The recent annual death rates in this group of insured persons has varied between 70 and 75 percent of the rate for the registration area.

these. Continued improvement is also shown in the death rate of young adults For the important working ages, up to 45, the 1933 rates for white persons were only one half of those of 20 years ago, while the decline among young colored adults was one fifth to one third.

The death rates for middle life and old age tended to show increases in 1933, except among white women. Although the rate for this age group was lower than that for 1911, no improvement has been shown during the last 12 years, and at the older ages, particularly among men, the rate has actually increased

DEATH RATES FOR CERTAIN CAUSES

The Bulletin states that the important factors in the reduction in the gross death rate since 1911 were substantial declines in such important causes as tuberculosis, pneumonia, conditions arising out of pregnancy and childbirth, diphtheria, measles, whooping cough, and typhoid fever In the case of tuberculosis and diphtheria, the improvement has been accelerated in recent years

Tuberculosis—The decline in the tuberculosis death rate among American and Canadian policyholders of this group, it is stated, has been practically continuous since 1911, when mortality for individual causes of death was first recorded, and has amounted to 71.1 percent in the 22 years. The reduction was 7 4 percent in 1933 as compared with the rate for 1932.

Typhoid fever.—The reduction of the typhoid fever death rate to a new minimum is cited as another triumph of official sanitary accomplishment. As compared with 1911, the decrease here amounts to 93 percent. Typhoid fever has become almost a negligible item in mortality statistics, although there are still a number of States and cities where the death rate from this cause remains surprisingly high.

Communicable diseases of childhood—"Twenty-two years ago", the Bulletin states, "58 9 industrial policyholders in every 100,000 died of measles, scarlet fever, whooping cough, or diphtheria, instead of 7.4 per 100,000 who died from these diseases in 1933 New low points were recorded in that year for all except scarlet fever."

Influenza and pneumonia.—It is noted that a year which began with an influenza epidemic closed with the lowest pneumonia death rate in the history of this group; and even for influenza the figure was below the average for the 10 preceding years The 1933 mortality with respect to these two diseases was much like that of 1929—each starting with a bad situation which was counterbalanced by marked improvement during the remainder of the year.

Diarrheal diseases.—Although the rate for diarrhea and enteritis at ages of one and over did not decline in 1933 from its previous minimum, the mortality from infantile diarrhea dropped to a new low

point. The rate for ages one and over was 4.6 per 100,000, representing a decline of 84 percent in this group since 1911.

Puerperal state.—The crude death rate for diseases of the puerperal state, which has been decreasing continuously for many years, fell to 9 4 per 100,000 in 1933, as compared with 10.7 in 1932 and 19.8 in 1911. It is pointed out, however, that the true rate should be based on live births, because of the changes in sex and age composition of the population and the fact that fewer women are exposed to this risk in recent years. This basic figure was not available for the persons included in the study.

INCREASED DEATH RATES

On the basis of crude death rates, three diseases—cancer, diabetes, and heart disease—recorded higher mortality in this group in 1933 than ever before. Most of the deaths from these causes fall in the higher age groups, and it is stated that there has been a shift in the age grouping of the policyholders whereby a larger proportion than formerly is now in the higher age groups. It was found necessary, therefore, to compute rates on a standardized age grouping.

Cancer.—When the cancer mortality rates are standardized, it is found that the increase in 1933 over 1932 was only eight-tenths of 1 percent, and over 1911 only 15.8 percent. The report states that the crude death rate gives an exaggerated picture of the rise in cancer deaths, but that even when all the elements are evaluated, such as an ageing population, improved definitions in reporting causes of death, and greater accuracy in diagnosis, there remains no doubt that the cancer death rate has been increasing and is still rising.

Diabetes.— The rise in the crude death rate for diabetes in this group of persons was 4.7 percent as compared with the rate for 1932, and 83.5 as compared with 1911. With standardized rates, however, the increase over 1932 was only one half of 1 percent, and that over 1911 only 37.7 percent. It is noted that mortality from diabetes is being steadily reduced among young people. The year 1933 was the ninth consecutive year to record a rise in the diabetes death rate in this group of insured persons.

Heart disease.—The crude death rate for diseases of the heart shows an increase, not uninterrupted, however, from 1923 to 1932. A different classification is used in 1933, and the rate for that year given in the accompanying table is not comparable with the rates for the earlier years. The Bulletin states, however, that the standardized rates show a lower figure for heart diseases in 1933 than for both 1930 and 1911, and only a slight rise as compared with 1932. With regard to types of diseases of the heart, it is stated:

When analysis of what has happened in recent years is extended to the several types of cardiac impairments, we find much that is encouraging in the trend of

the heart disease death rate First, only in the higher age groups is the mortality increasing; and the heart disease prevailing in this period of life is very largely of the arteriosclerotic or senescent type. Accordingly, the increased number of deaths is due, in great measure, to the aging of the population, whereby more and more persons attain those higher ages where senile degeneration of the heart is the most common cause of death This may be a byproduct of the increase of the average duration of human life The encouraging side of the picture is a marked declining tendency in the death rate from the endocardial and valvular affections in early adult and middle life These types of cardiac disease have their origin largely in acute rheumatism, syphilis, certain communicable diseases of childhood, and focal infections We may look forward to continued improvement as the result of the decline which is going on in the incidence of these controllable diseases

Death rates per 100,000 for principal causes, ages 1 and over, for 1911 and 1923 to 1933

[Industrial insurance department, Metropolitan Life Insurance Co.

Cause of death	1933 [1]	1932	1931	1930	1929	1928	1927	1926	1925	1924	1923	1911
All causes of death	840 3	835 3	845 8	837 1	891 9	869 3	842 2	885.7	846 3	848 0	897 1	1,253 0
Typhoid fever	1 6	1 7	2 4	2 4	2 4	2 7	4 7	4.2	4 6	4.4	5 2	22.8
Communicable diseases of childhood	7 4	9.5	11 9	12 4	16 7	19 0	19 7	25 9	19 7	26.2	33 1	58 9
Measles	1 3	1 4	2 6	2 3	2 4	4 2	3 4	8 0	2 5	5 7	8 4	11 4
Scarlet fever	2.6	2 8	3 2	2.5	2 7	2 6	3 0	3 4	3 4	4 3	4 4	13 1
Whooping cough	1 0	1 4	1 7	1 9	3 0	2 7	3 1	5 0	3 6	3 5	4 8	7 1
Diphtheria	2 5	3 8	4 3	5 7	8 6	9 5	10 2	9 5	10 2	12 7	15 5	27 3
Influenza and pneumonia	73 6	74 5	81 3	75 9	111 7	94 8	78 7	105.6	88.3	84 4	107 7	131 2
Influenza	18 7	17.7	19 2	13 2	37 7	22 0	15 7	27 4	19 4	14 2	30 1	15 9
Pneumonia	54 8	56 7	62 1	62 7	74 0	72 8	63 0	78 2	69 0	70 2	77 6	115 3
Poliomyelitis	.6	1 0	2 6	1 1	6	1 2	2.0	7	1 4	1 0	7	1 6
Tuberculosis, all forms	65 0	70 2	76 7	81.3	87 3	90 6	93 8	99 5	98 2	104 4	110 5	224.6
Tuberculosis of respiratory system	58 4	62 5	68 1	71 3	77 7	80 0	83 0	87 9	87 0	93.4	100.6	203 0
Cancer, all forms	95 6	92 4	85 4	79 5	78 8	77.0	75 6	75 1	71.8	71.5	72 7	68.0
Diabetes mellitus	24 4	23 3	21 4	18 7	18 6	17.9	17 1	17 0	15 5	15 1	16.2	13.3
Alcoholism	2 3	2 5	2 9	3 2	3 5	3.3	3 5	3 7	3 0	2.9	3 0	4.0
Cerebral hemorrhage, apoplexy	[2] 64 5	[2] 62 9	[2] 61 3	[2] 61 3	58 9	57 6	56 0	56 5	54 4	61 1	61 9	64.2
Diseases of heart [3]	[3] 63 4	157 5	150 1	147 1	149 0	144 4	134 7	136 4	128 7	125.2	128.7	141 8
Diarrhea and enteritis	4 6	4 6	5 9	8 0	7 9	8 7	9 1	10 5	12 3	11 3	11.1	28 0
Chronic nephritis (Bright's disease)	68 0	69 6	68 1	69 2	70 6	71 8	70 8	74 9	71 2	66 5	69 6	95 0
Puerperal state, total	9 4	10 7	11 9	12 3	13 8	14 2	15 7	15 6	16 9	17 2	17 9	19 8
Total external causes	72 0	71 8	78 0	79 4	80 6	77.8	79 8	77 2	78 3	76 9	77 8	97.9
Suicides	10 1	10 8	10 2	10 0	8 7	8 5	8 4	7 8	7 0	7 3	7 4	13 3
Homicides	6.3	6.2	7 1	6 8	6 7	6.8	7 4	7 2	7 4	7 2	7 3	7 2
Accidents—total	55.6	54 8	60 7	62 6	65 2	62 5	63 9	62 3	63 9	62 4	63 0	77.4
Accidental burns	3.3	3 7	3 8	4 5	4.9	5 3	5 3	6 1	6 1	6 4	6 3	8.8
Accidental drowning	6.1	6 0	6 5	6 3	6.5	7.1	6 8	6 3	6 5	7 3	6 7	10.2
Accidental traumatism by fall	10 4	10.2	10 1	9 7	9 1	8.0	8 5	7 9	8 1	7 7	8.4	13.2
Accidental traumatism by machines	.8	.8	1 0	1 3	1 6	1 2	1 4	1.4	1.3	1 3	1 7	1.8
Railroad accidents	2 9	2 8	2.8	3 0	3 9	3 9	4.1	4 2	4.0	4 0	4 9	9 5
Automobile accidents	20.0	19.2	22.3	21 2	21 3	18 7	18 7	17 0	16 8	15 9	15 4	2 3
All other accidents	12.1	12 1	14 4	16 6	17.8	18 3	19 1	19 4	21 2	19.7	19.5	31 6
Other diseases and conditions	187.9	183 1	185 9	185.3	191 5	188 3	181.0	183 6	183 4	180 9	181 7	283.5

[1] All 1933 death rates subject to slight correction, since they are based on provisional estimates of lives exposed to risk

[2] Rates for 1930, 1931, 1932, and 1933 not comparable with those for other years, due to changes in classification procedure

[3] Excluding pericarditis, acute endocarditis, acute myocarditis, and angina pectoris.

MILK-SANITATION RATINGS OF CITIES

Cities for Which Milk-Sanitation Ratings of 90 Percent or More Were Reported by State Milk-Sanitation Authorities During the Month of January 1934

In accordance with the policy announced in the Public Health Reports of January 26, 1934, giving the first publication of the list of cities for which milk sanitation ratings of 90 percent or more had been reported, additional supplementary lists of such ratings will be published monthly. A table is presented herewith showing the cities for which ratings of 90 percent or more were reported during the month of January 1934.

The rules governing inclusion in these lists and the significance of the milk-sanitation ratings made in accordance with the Public Health Service rating methods were presented in the Public Health Reports of January 26, 1934.

Cities included in this and the previous list are again advised to bring their milk sanitation status to the level required by the 1933 edition of the Public Health Service Milk Ordinance and Code, since this edition will be used for ratings made in 1934. Cities which are not now on the lists should improve their milk supplies as much as possible and then request the State milk control authority to determine their ratings.

State milk control authorities are urged to equip themselves to make milk sanitation ratings of their cities as soon as possible in fairness to their cities. States already equipped for this work should not permit ratings of their cities to lapse, as no rating more than 2 years old will be included in the complete semiannual revision of the list to be published next July.

Cities having ratings of 90 percent or more according to reports received during January 1934

City	Pasteurized milk rating	Raw milk rating	Percentage of milk pasteurized	Date of rating
Big Spring, Tex	95	90	23	Oct 19, 1933
Bryan, Tex		98	0	October 1933
El Paso, Tex	95	97	65	Oct. 14, 1933

COURT DECISION ON PUBLIC HEALTH

School medical inspector held to be an employee and not a public officer.—(Pennsylvania Superior Court; *Kosek* v. *Wilkes-Barre Tp. School Dist.*, 168 A. 518; decided Oct. 2, 1933.) The plaintiff was appointed medical inspector by the board of directors of the defendant school district for a period of 10 months. After performing his duties for about 3 months the plaintiff, without notice or cause, was dismissed from service pursuant to a resolution of the board of school

directors. He held himself in readiness to perform his duties during the remaining period of his contract, and afterward brought action to recover the salary for the remainder of the term for which he had been appointed. The case was tried without a jury and, at the conclusion of the plaintiff's testimony, the defendant rested, moving for judgment upon the ground that under the law the plaintiff was an appointed officer removable at the pleasure of the appointing power The conclusion reached by the trial court was that the plaintiff was not an "appointed public officer" removable at pleasure under article 6, section 4, of the State constitution and that judgment should be entered for the plaintiff From the trial court's judgment an appeal was taken to the superior court, which affirmed the judgment The superior court quoted at length from the opinion of the lower court, wherein the distinction between an office and an employment was dwelt upon, and then proceeded to state, in part, as follows

* * * In the present case the status of the medical inspector arises directly from a contract of hiring between him and the school district. The salary of the medical inspector is fixed by the employer, no commission is issued, no oath is taken, and the appointment is made, at the discretion of the board, of either a legally qualified physician having at least 2 years' experience in the practice of his profession or a health officer of a municipality. True it is that the duties of the medical inspector involve judgment, intelligence, discretion, and technical and "medical knowledge"; but they involve no relationship to the exercise on his part of what is ordinarily designated as a governmental function Undoubtedly the care of public health, particularly the health of school children, is a subject matter of general concern and is the exercise of a governmental function just as the fighting of fires through fire departments and the protection of life and property through police departments, yet we are not convinced that one charged with medical inspections is other than an employee of the political division that employs him.

DEATHS DURING WEEK ENDED FEB. 3, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Feb 3, 1934	Corresponding week, 1933
Data from 86 large cities of the United States:		
Total deaths	8,806	8,698
Deaths per 1,000 population, annual basis	12 3	12 1
Deaths under 1 year of age	625	696
Deaths under 1 year of age per 1,000 estimated live births	58	[1] 59
Deaths per 1,000 population, annual basis, first 5 weeks of year	12.5	12.9
Data from industrial insurance companies.		
Policies in force	67,435,280	69,100,292
Number of death claims	14,546	15,663
Death claims per 1,000 policies in force, annual rate	11 2	11 8
Death claims per 1,000 policies, first 5 weeks of year, annual rate	11 1	11.8

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Feb. 10, 1934, and Feb. 11, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb 10, 1934, and Feb 11, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb 10, 1934	Week ended Feb 11, 1933	Week ended Feb 10, 1934	Week ended Feb 11, 1933	Week ended Feb 10, 1934	Week ended Feb 11, 1933	Week ended Feb 10, 1934	Week ended Feb 11, 1933
New England States								
Maine		4	6	228			0	1
New Hampshire					181		0	0
Vermont	1	1			75	5	0	0
Massachusetts	9	25		40	1,906	201	1	0
Rhode Island	2	1		11	6		0	0
Connecticut	8	3	18	87	33	148	0	2
Middle Atlantic States:								
New York	31	65	[1] 30	[1] 56	860	1,997	4	6
New Jersey	20	24	17	83	226	631	2	2
Pennsylvania	56	85			1,835	970	2	3
East North Central States:								
Ohio	33	28	14	40	407	709	3	0
Indiana	38	43	45	175	405	9	3	2
Illinois	29	42	48	74	436	169	8	18
Michigan	12	28	8	35	64	741	0	4
Wisconsin	6	6	121	341	805	316	1	1
West North Central States								
Minnesota	5	4		3	177	644	0	0
Iowa [2]	17	10	14		119		1	1
Missouri		31	26	18	980	159	1	4
North Dakota	7		38	28	208	73	0	1
South Dakota		3	4		459	13	0	0
Nebraska	6	13	11		86	4	0	0
Kansas	10	8	4	65	84	205	2	2
South Atlantic States								
Delaware	1	2		3	136		0	0
Maryland [3]	13	10	45	132	173	4	0	0
District of Columbia	6	9	4	5	324	1	1	3
Virginia	37	24			785	414	2	3
West Virginia	18	9	55	481	32	456	0	1
North Carolina [3]	23	13	67	270	2,375	278	1	2
South Carolina	21	10	591	2,097	495	21	0	9
Georgia [3]	23	5	177	414	2,122	4	0	0
Florida	8	12	4	184	55	11	0	0

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb 10, 1934, and Feb 11, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb. 10, 1934	Week ended Feb 11, 1933	Week ended Feb 10, 1934	Week ended Feb 11, 1933	Week ended Feb 10, 1934	Week ended Feb 11, 1933	Week ended Feb 10, 1934	Week ended Feb 11, 1933
East South Central States:								
Kentucky	33	22	31	161	183	79	0	0
Tennessee	15	3	207	201	794	86	1	0
Alabama [3]	24	32	288	298	579	1	0	2
Mississippi	14	5					0	1
West South Central States								
Arkansas	8	11	123	347	529	19	0	0
Louisiana [3]	26	17	19	16	89	14	0	2
Oklahoma [4]	12	9	156	273	300	10	0	1
Texas [3]	133	72	493	470	878	502	8	5
Mountain States								
Montana	4		34	185	27	149	0	0
Idaho			1	3	63	25	0	0
Wyoming	2				12	30	0	0
Colorado	17	4		73	64	10	3	2
New Mexico	7	10	10	9	114	14	1	1
Arizona	7	7	26	40	14		0	1
Utah [3]		4			939	1	0	1
Pacific States								
Washington	1	3			765	25	1	0
Oregon	2	5	50	175	53	140	0	0
California	40	64	34	183	1, 187	363	2	2
Total	785	786	2, 819	7, 304	22, 494	9, 651	48	83

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 10, 1934	Week ended Feb 11, 1933	Week ended Feb 10, 1934	Week ended Feb 11, 1933	Week ended Feb 10, 1934	Week ended Feb 11, 1933	Week ended Feb 10, 1934	Week ended Feb 11, 1933
New England States:								
Maine	0	0	16	35	0	0	1	1
New Hampshire	0	0	24	50	0	0	0	0
Vermont	0	0	10	13	0	0	1	0
Massachusetts	0	0	245	383	0	0	2	0
Rhode Island	0	0	17	32	0	0	0	0
Connecticut	0	0	58	98	0	2	2	2
Middle Atlantic States:								
New York	2	1	692	783	0	0	7	8
New Jersey	0	0	203	334	0	0	3	3
Pennsylvania	0	0	695	846	0	0	10	1
East North Central States:								
Ohio	0	0	528	355	1	5	7	3
Indiana	1	0	235	129	2	0	2	5
Illinois	1	1	600	303	2	9	4	3
Michigan	2	1	597	527	0	0	6	4
Wisconsin	0	0	199	122	32	8	2	2
West North Central States:								
Minnesota	0	0	76	83	11	0	2	1
Iowa [3]	2	0	84	38	6	51	1	0
Missouri	0	1	121	77	12	0	2	2
North Dakota	0	0	45	8	0	0	0	0
South Dakota	0	0	16	11	4	2	1	0
Nebraska	0	0	17	23	3	3	0	0
Kansas	0	0	112	59	9	0	1	1
South Atlantic States:								
Delaware	0	0	4	8	0	0	0	0
Maryland [3]	0	0	72	97	0	0	3	3
District of Columbia	0	0	19	11	0	0	0	0
Virginia	1	0	70	42	0	0	11	4
West Virginia	0	4	52	38	0	0	3	5
North Carolina [3]	0	1	64	48	0	1	1	2
South Carolina	1	0	9	5	4	0	18	0
Georgia [3]	0	0	10	10	0	0	4	2
Florida	0	0	5	14	0	0	1	9

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 10, 1934, and Feb. 11, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb. 10, 1934	Week ended Feb. 11, 1933	Week ended Feb. 10, 1934	Week ended Feb. 11, 1933	Week ended Feb. 10, 1934	Week ended Feb. 11, 1933	Week ended Feb. 10, 1934	Week ended Feb. 11, 1933
East South Central States								
Kentucky	1	0	68	40	3	0	7	6
Tennessee	0	0	45	26	2	0	4	3
Alabama [3]	0	2	34	23	0	0	2	4
Mississippi	0	0	26	11	2	2	5	0
West South Central States								
Arkansas	0	1	11	17	1	10	1	1
Louisiana [3]	0	2	25	12	1	2	4	5
Oklahoma [4]	0	1	27	23	1	7	1	2
Texas [3]	0	2	142	48	20	45	22	9
Mountain States								
Montana	0	0	25	13	0	1	3	0
Idaho	0	0	4	1	4	8	3	0
Wyoming	1	0	6	4	0	0	0	0
Colorado	1	0	52	26	2	0	1	1
New Mexico	0	0	38	11	0	0	3	2
Arizona	0	0	44	25	0	0	2	2
Utah [2]	0	0	9	8	0	0	0	0
Pacific States								
Washington	0	0	46	42	5	6	2	4
Oregon	1	0	58	27	7	2	1	0
California	9	1	266	195	5	39	13	5
Total	23	18	5,821	5,224	139	203	169	105

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Feb. 10, 1934, 18 cases, as follows: North Carolina, 2; Georgia, 8; Alabama, 3; Louisiana, 1; Texas, 4.
[4] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1934										
Arkansas	2	30	143	46	1,614	9	0	44	28	13
Georgia	6	56	473	53	4,014	12	0	61	5	24
Maine	1	3	31		17		3	50	0	2
Missouri	3	263	72	1	2,254		1	614	38	15
Nebraska		47	23		177		1	130	13	2
North Carolina	4	185	278		8,116	13	4	415	1	16
North Dakota	2	14	6		420		0	98		
South Carolina	5	299	2,915	710	1,398	155	9	57	3	30
Vermont		4			240		0	82	0	10
Wyoming		1			249		0	38	14	1

January 1934

	Cases
Chicken pox:	
Arkansas	94
Georgia	232
Maine	381
Missouri	536
Nebraska	330
North Carolina	808
North Dakota	79
South Carolina	215
Vermont	200
Wyoming	171
Conjunctivitis:	
Georgia	15
Dengue:	
Georgia	1
South Carolina	1
Diarrhea:	
South Carolina	483
Dysentery:	
Georgia (amebic)	2
Georgia (bacillary)	3
Missouri	7
Nebraska (amebic)	5
North Dakota	1
German measles:	
Maine	154
North Carolina	23
Hookworm disease:	
Arkansas	9
Georgia	471
South Carolina	171
Lethargic encephalitis:	
Georgia	2
Missouri	7
North Dakota	1
South Carolina	12

Mumps	Cases
Arkansas	24
Georgia	95
Maine	10
Missouri	150
Nebraska	69
North Dakota	1
South Carolina	170
Vermont	50
Wyoming	12
Ophthalmia neonatorum	
North Carolina	1
South Carolina	42
Paratyphoid fever	
Georgia	1
South Carolina	3
Rabies in animals	
Maine	6
Missouri	16
South Carolina	24

Rocky Mountain spotted fever	Cases
North Carolina	2
Septic sore throat	
Georgia	41
Missouri	14
Nebraska	8
North Carolina	15
Tetanus	
South Carolina	2
Tularemia	
Arkansas	1
Georgia	12
Maine	1
Missouri	12
North Carolina	4
South Carolina	12
Typhus fever	
Georgia	38
North Carolina	4
South Carolina	3

Undulant fever	Cases
Georgia	2
Maine	4
Missouri	1
North Dakota	1
South Carolina	4
Vermont	3
Vincent's infection	
Maine	1
North Dakota	5
Whooping cough	
Arkansas	53
Georgia	231
Maine	276
Missouri	275
Nebraska	256
North Carolina	1,529
North Dakota	30
South Carolina	505
Vermont	187
Wyoming	43

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb 3, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	1	------	0	0	5	0	0	1	1	2	20
New Hampshire											
Concord	0	------	0	14	0	0	0	0	0	0	12
Manchester	0	------	1	0	1	0	0	1	0	0	21
Nashua	0	------	0	1	0	6	0	0	0	0	------
Vermont											
Barre	0	------	0	0	0	0	0	0	0	0	2
Burlington	0	------	0	1	0	3	0	0	0	13	7
Massachusetts											
Boston	1	------	1	415	28	59	0	10	1	81	248
Fall River	1	------	0	0	4	4	0	2	0	4	32
Springfield	0	------	0	1	3	0	0	1	0	10	38
Worcester	0	------	0	69	6	5	0	1	0	5	48
Rhode Island											
Pawtucket	0	------	0	0	0	0	0	0	0	0	18
Providence	0	------	0	0	7	12	0	3	0	13	62
Connecticut											
Bridgeport	0	------	0	4	4	15	0	0	0	1	35
Hartford	3	1	0	1	3	12	0	0	0	2	28
New Haven	0	------	0	1	7	2	0	0	0	5	58
New York:											
Buffalo	4	------	0	274	22	29	0	7	0	23	158
New York	31	24	10	34	172	220	0	83	1	93	1,536
Rochester	1	------	0	1	2	30	0	0	0	8	81
Syracuse	0	------	0	1	9	3	0	0	0	33	56
New Jersey:											
Camden	0	1	1	26	1	13	0	0	0	5	30
Newark	0	7	1	4	10	13	0	5	0	17	119
Trenton	0	1	2	10	5	20	0	3	0	3	47
Pennsylvania											
Philadelphia	9	9	4	970	46	92	0	22	1	56	524
Pittsburgh	11	9	4	23	19	36	0	6	0	35	145
Reading	0	------	2	2	1	6	0	0	0	7	28
Scranton	0	------	0	0	0	9	0	0	0	1	------
Ohio											
Cincinnati	2	------	1	275	16	22	0	9	0	24	151
Cleveland	7	32	0	5	22	84	0	10	1	79	177
Columbus	2	2	2	3	6	29	0	4	0	8	92
Toledo	0	2	2	60	9	41	0	6	0	51	79
Indiana:											
Fort Wayne	12	------	0	3	0	15	0	1	0	0	21
Indianapolis	1	------	0	186	18	19	0	3	1	17	------
South Bend	0	------	0	0	2	3	0	0	0	0	21
Terre Haute	0	------	1	43	6	2	0	2	0	0	21

City reports for week ended Feb. 3, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Illinois											
Chicago	1	3	0	31	73	217	0	40	1	166	736
Springfield	1	1	0	3	3	4	0	1	0	12	20
Michigan											
Detroit	7	8	3	4	30	100	0	25	0	98	313
Flint	1	------	0	5	6	60	0	1	0	11	26
Grand Rapids	0	------	0	2	1	3	0	0	0	0	39
Wisconsin											
Kenosha	0	------	0	1	0	25	0	0	0	6	11
Madison	0	------	------	2	------	6	0	------	0	23	19
Milwaukee	1	3	2	3	8	43	0	4	0	78	117
Racine	1	------	0	0	1	8	0	0	0	1	10
Superior	0	------	1	1	0	0	0	0	0	4	13
Minnesota											
Duluth	0	------	0	0	1	0	0	0	0	0	21
Minneapolis	4	------	1	3	10	26	0	3	0	10	109
St. Paul	0	------	0	1	15	10	0	2	0	1	70
Iowa											
Des Moines	2	------	------	0	------	12	0	------	0	0	21
Sioux City	2	------	------	5	------	0	0	------	0	1	------
Waterloo	1	------	------	0	------	1	0	------	0	4	------
Missouri											
Kansas City	6	0	2	1	17	26	0	3	0	5	129
St. Joseph	0	------	0	1	5	0	0	0	0	1	20
St. Louis	27	2	------	733	17	32	1	15	0	39	234
North Dakota											
Fargo	0	------	0	66	0	0	0	0	0	1	4
Grand Forks	0	------	0	1	0	0	0	0	0	1	------
South Dakota											
Aberdeen	0	------	0	2	0	1	0	0	0	0	------
Sioux Falls	0	------	0	26	0	0	0	0	0	0	7
Nebraska											
Omaha	2	------	0	65	7	5	1	3	0	6	58
Kansas											
Topeka	0	------	0	0	0	10	0	0	0	8	5
Wichita	0	------	0	2	3	4	0	1	0	3	36
Delaware											
Wilmington	3	------	0	31	2	5	0	0	0	3	29
Maryland											
Baltimore	4	2	2	87	23	28	0	13	0	116	214
Cumberland	0	1	0	4	0	5	0	0	0	3	13
Frederick	------	------	------	------	------	------	------	------	------	------	------
District of Columbia.											
Washington	13	1	1	215	19	14	0	10	0	27	180
Virginia:											
Lynchburg	1	------	0	0	1	0	0	0	0	0	7
Richmond	2	2	2	3	5	5	0	2	0	1	53
Roanoke	1	0	2	1	7	3	0	3	0	0	26
West Virginia											
Charleston	1	------	0	0	4	0	0	0	0	0	17
Huntington	1	------	0	0	0	3	0	0	0	0	------
Wheeling	0	------	0	1	2	8	0	0	0	8	18
North Carolina.											
Raleigh	0	------	0	5	2	0	0	1	0	8	14
Wilmington	0	------	0	0	4	0	0	0	0	1	14
Winston-Salem	1	2	0	198	4	2	0	1	0	4	21
South Carolina:											
Charleston	0	39	0	2	4	0	0	1	0	0	32
Columbia	0	------	1	0	5	0	0	0	0	0	17
Greenville	0	------	0	11	2	1	0	0	0	4	17
Georgia.											
Atlanta	6	17	2	158	14	2	0	5	1	6	86
Brunswick	0	1	1	44	0	0	0	0	0	5	7
Savannah	1	29	2	44	8	0	0	0	1	0	35
Florida.											
Miami	1	------	0	0	2	1	0	1	0	0	33
Tampa	4	1	1	1	2	2	0	2	0	0	27
Kentucky:											
Ashland	2	1	------	0	------	1	0	------	1	3	------
Lexington	1	------	0	2	3	0	0	0	0	7	21
Louisville	2	2	0	0	13	27	0	1	0	2	75

City reports for week ended Feb 3, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Tennessee:											
Memphis	1	------	5	156	12	8	1	4	0	5	96
Nashville	0	------	1	107	6	2	0	0	0	7	41
Alabama											
Birmingham	4	6	2	3	11	5	0	1	1	0	73
Mobile	1	------	0	0	1	1	0	2	0	0	19
Montgomery	0	------	------	4	------	2	0	------	0	3	------
Arkansas											
Fort Smith	0	------	------	74	------	3	1	------	0	0	------
Little Rock	0	------	0	51	2	0	0	2	0	0	4
Louisiana											
New Orleans	13	4	4	8	9	15	1	11	6	0	156
Shreveport	1	------	0	2	4	1	0	2	0	3	39
Oklahoma											
Tulsa	0	------	------	19	------	2	0	------	0	1	------
Texas											
Dallas	3	2	1	0	11	2	0	1	0	0	61
Fort Worth	0	------	1	0	9	6	0	2	1	0	39
Galveston	2	------	0	0	2	6	0	2	0	0	15
Houston	11	------	0	0	14	7	2	7	0	1	75
San Antonio	2	------	3	2	10	15	0	4	0	0	52
Montana											
Billings	0	------	0	0	0	0	0	0	0	3	14
Great Falls	0	------	0	4	1	0	0	0	0	1	8
Helena	0	------	0	0	0	0	0	0	1	0	4
Missoula	0	------	0	0	0	0	0	0	0	0	3
Idaho											
Boise	0	------	0	1	1	0	0	0	0	0	8
Colorado:											
Denver	1	27	2	31	8	12	0	7	0	88	88
Pueblo	0	------	2	0	1	1	0	0	0	9	10
New Mexico											
Albuquerque	1	------	0	2	1	0	0	7	0	5	15
Utah:											
Salt Lake City	0	------	0	644	4	7	0	0	0	34	49
Nevada:											
Reno	0	------	0	0	0	0	0	0	0	0	3
Washington											
Seattle	0	------	1	1	9	12	0	3	0	63	88
Spokane	0	1	1	371	3	0	0	------	2	15	33
Tacoma	0	------	1	2	4	2	0	2	2	22	32
Oregon											
Portland	0	2	2	15	5	20	5	2	0	1	72
Salem	0	------	0	0	0	1	0	0	0	4	------
California											
Los Angeles	18	30	1	45	19	79	0	23	1	48	321
Sacramento	0	2	0	4	3	5	0	1	0	3	29
San Francisco	0	1	1	29	20	18	0	14	0	10	174

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
New York			
New York	2	1	0
Pennsylvania			
Philadelphia	1	0	1
Ohio			
Cleveland	1	0	0
Toledo	1	0	0
Illinois			
Chicago	2	1	0
Wisconsin:			
Milwaukee	1	0	0
Iowa			
Des Moines	1	0	0
Missouri			
Kansas City	1	0	0
St Joseph	1	0	0
Georgia			
Atlanta	2	0	0
Tennessee			
Memphis	1	0	0
California			
Los Angeles	2	1	2

Lethargic encephalitis.—Cases New York, 1, Pittsburgh, 1, Columbus, 1, Racine, 1, St. Louis, 2, Birmingham, 2, Spokane, 1

Pellagra.—Cases Philadelphia, 1, Raleigh, 2, Atlanta, 2, Savannah, 1, Louisville, 1; New Orleans, 1; Dallas, 1

Typhus fever—Cases: New York, 1, Charleston, S C., 1, Mobile, 1, Montgomery, 2.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended January 27, 1934.—During the 2 weeks ended January 27, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba [1]	Saskatchewan	Alberta [2]	British Columbia	Total
Cerebrospinal meningitis		1								1
Chicken pox		6	2	397	615	70	70	3	73	1,236
Diphtheria	5	5	1	36	22	14	2		1	86
Erysipelas				15	12	1			1	29
Influenza		34		13	15	1			20	83
Measles			2	51	149	33	15	4	9	263
Mumps					204		1		92	297
Paratyphoid fever							1			1
Pneumonia		6			32		1		9	48
Poliomyelitis				1					1	2
Scarlet fever		21	15	179	331	16	34	6	192	794
Smallpox					1					1
Trachoma									2	2
Tuberculosis	1	3	21	121	76	3	4	2	32	263
Typhoid fever				31	9					40
Undulant fever				2	3					5
Whooping cough		8	1	372	178	14	5	2	29	609

[1] No report was received from Manitoba for week ended Jan 20, 1934
[2] No report was received from Alberta for week ended Jan 27, 1934

Ontario Province—Communicable diseases—Years 1933 and 1932, comparative.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the years 1933 and 1932, as follows:

Disease	1933		1932	
	Cases	Deaths	Cases	Deaths
Actinomycosis	3		3	
Cerebrospinal meningitis	48	32	46	28
Chancroid			8	
Chicken pox	10, 415	2	9, 168	
Conjunctivitis	2		52	
Diphtheria	529	26	1, 496	72
Dysentery	37	4		12
Encephalitis	13	9	21	12
Erysipelas	114	6	126	13
Gonorrhea	2, 479		2, 825	1
German measles	211		342	
Influenza	4, 017	141	3, 922	171
Jaundice	16		45	
Leprosy			2	
Malignant edema	1			
Measles	6, 779	24	32, 245	37
Mumps	5, 914		7, 541	1
Paratyphoid fever	135	2	78	
Pneumonia		1, 528		1, 630
Poliomyelitis	53	1	175	12
Puerperal septicemia		6		13
Scarlet fever	3, 753	15	3, 438	21
Septic sore throat	138	6	95	13
Smallpox	15		91	
Syphilis	2, 246	9	2, 110	14
Tetanus	7	7	2	1
Trachoma	51	2	3	
Trench mouth	7		21	
Trichinosis	1			
Tuberculosis	2, 141	520	2, 330	599
Tularaemia	9		9	
Undulant fever	152		82	
Whooping cough	5, 280	31	5, 647	41

JAMAICA

Communicable diseases—4 weeks ended January 27, 1934.—During the 4 weeks ended January 27, 1934, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox		23	Leprosy		1
Diphtheria	2	2	Puerperal fever		2
Dysentery	15	15	Tuberculosis	36	80
Erysipelas		2	Typhoid fever	23	58

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given

CHOLERA

[C indicates cases, D, deaths; P, present]

Place		June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Oct. 1–28, 1933	Week ended— November 1933 4	11	18	25	December 1933 2	9	16	23	30	January 1934 6	13	20	27	Feb 3, 1934
China:																			
Canton	C	1																	
Hankow	C	2	1	1															
Tientsin	C	4																	
India	C	6,881	7,695	14,422	9,939	2,306	1,934	1,624	1,707	1,944	1,999	1,584	1,364						
	D	3,047	3,237	6,654	4,846	1,155	1,038	890	840	957	906	700	613						
Bombay Presidency	C	3,869	3,604	3,111	1,376	352	234	239	275	383	370	184	129	138	138				
	D	1,609	1,436	1,412	634	175	147	129	143	188	201	105	76	69	65				
Bombay	C	6	1	5	4	1				4					1				
Calcutta	C	77	59	93	68	13	11	13	18	10	13	12	6	22	15	14	29	20	
Chittagong	C		1		1					1		1	2			2			
Madras Presidency	C	276	923	1,058	727	247	263	190	239	346		739	905						
	D	74	338	444	292	138	111	97	107	153		263	335						
Madras	C				4	1		2	3	61	25	6	20	9	4	4	6	2	
	D				1	2			2	26	11	4	9	6	2	2		2	
Rangoon	C	2																	
Vizagapatam	C	4			1														
India (French).																			
Chandernagor	D			2															
Karikal	C			1								1	1						
Pondichery	C		2																
Indo-China (see also table below): Saigon and Cholon	C	8	2																
Philippine Islands [1]																			
Antique Province	C				17	2			6	8									
	D				16	1			5	6									
Bohol Province	C		1	6	87	35	31	39	68	51	23	22	11	33	78	63	93	58	30
	D			3	47	21	14	25	41	25	16	16	10	27	59	37	66	38	21
Cebu Province	C	90	26	39	63	23	18	7	23	15	10	1	6	43	12	12	6	4	1
	D	39	20	28	36	16	12	4	13	10	9	1	3	31	8	12	7	3	1
Cebu	C		1	9	21	1	11	4	1								1		1
	D		1	7	8	1	6	1									1		1

Naga	C					9	1	1	7	4						2			
	D					6	1	1	1	3						1			
Iloilo Province	C	1			12	1			1							1			
	D	1			11	2			1							1			
Iloilo	C	1				1			1										
	D	1				2			1										
Leyte Province	C		2	1															
	D		2	1															
Occidental Negros Province	C	6	1							2	2			5	8		9	10	
	D	7	1							1	2			3	5		10	8	
Oriental Negros Province	C										1	4	1		23	21	37	15	13
	D										1	4	1		14	9	21	8	10
Samar Province	C		31	[2] 32	[3] 20														
	D		20	[2] 20	[3] 14														
Siam	C	1																	1

Place		May 1933			June 1933			July 1933			August 1933			September 1933			October 1933	
		1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Indo-China (French) (see also table above)																		
Cambodia [4]	C	11	14	17	23	31	14	3	1			1						
	D	8	10	9	12	17	6	3	1			1						
Cochin-China [4]	C	5	9	6	4	8	5	6	2	12	3	2	1	1	2	2	5	5
	D	4	8	6	4	8	4	5	2	3	3	2	1	1	2	2	5	3

[1] During the week ended Feb 10, 1934, cholera was reported in the Philippine Islands as follows Bohol Province—Balilihan, 1 case, 1 death, Calape, 3 cases, 3 deaths, Clarin 15 cases, 7 deaths, Cortes, 2 cases, 2 deaths, Loon, 2 cases 1 death, Tagbilaran, 1 case, Tubigon, 5 cases, 5 deaths Occidental Negros Province—Calatiaba, 7 cases, 4 deaths Oriental Negros Province—Ayuquitan, 1 case, 1 death, Tanjay, 3 cases, 1 death.

[2] For 2 weeks.

[3] For the month of October

[4] Reports incomplete

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE[1]

[C indicates cases, D, deaths, P, present]

Place		June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30 1933	Oct 1–28, 1933	Week ended— Nov. 4, 1933	Nov. 11	Nov. 18	Nov. 25	Dec. 2, 1933	Dec. 9	Dec. 16	Dec. 23	Dec. 30	Jan. 6, 1934	Jan. 13	Jan. 20	Jan. 27
Argentina. (See table below.)																		
Azores:																		
Fayal	C			1														
St. Michaels	C			7														
Bolivia (See table below)																		
British East Africa (see also table below)																		
Kenya	C	7	13	30	18	8	26	3		4	4	2						
Tanganyika	D					1												
Uganda	C	58	77	113	63	27	18	21	15	19	25							
	D	58	77	109	61	27	17	21	14	16	23							
Ceylon: Colombo	C	2		1	1					1								1
	D	2		1	1					1								1
Plague-infected rats		4	1								1						1	2
China. Manchuria.[2]																		
Dutch East Indies: West Java	C	1,434	899	1,465	[3] 816	433	449	336										
	D	1,428	898	1,463	[3] 814	428	446	336										
Ecuador. (See table below)																		
Egypt																		
Alexandria	C	4	1											1			1	
Asyut	C																1	
Faiyum	C	4		2	1												1	
Gharbiya	C			3	2												1	
	D			2	3													
Girga	C	2																
Minya	C	1		1														
Qena	C		1															
Luxor	C		2															
France: Marseille	C		8															
	D		3															
Plague-infected rats		3	2				1											
Hawaii Territory: Hawaii Island—Hamakua—Plague-infected rats				1			2			1		2	1	1		1		

India	C	3,869	6,209	13,642	11,755	2,316	3,189	2,743	2,789	3,194	2,487	2,540	2,244					
	D	2,616	3,560	7,971	6,430	1,216	1,637	1,524	1,544	1,749	1,361	1,535	1,450					
Bassein	C	11	7	3							1				2	2	1	
Plague-infected rats		2	1									1	1					
Bombay Presidency	C	2,448	3,971	8,069	4,922	1,598	1,565	1,421	1,215	1,342	1,196	966	830	1,167	1,328			
	D	1,493	2,313	5,117	2,928	992	873	947	809	850	810	659	547	689	856			
Bombay	C	1	1	7	3		1							1		1		
Plague-infected rats		5	5	3	1	3	3	1	1			1						
Poona	C				475	61												
	D				527	53												
Calcutta	C											1[4]						
	D											1[4]						
Madras Presidency	C	372	867	1,181	521	120	137	122	158	144		136	123					
	D	148	395	547	294	65	55	61	76	56		62	54					
Rangoon	C			2	1				1									
Plague-infected rats		3	1	2				1	1		1	1	1		1			
Indo-China (see also table below)																		
Pnom-Penh	D	2	3	2	2							1					1	
Saigon and Cholon	C	2	3															
Iraq:																		
Baghdad	C	7		3	1	1	1				1		2	2		1		
Basra	C	3																
Libya	C			10							9			2				
	D			3							5			1				
Madagascar (see also table below): Tamatave	C		1															
Morocco	C	8																
Peru (See table below.)																		
Senegal. (See table below.)																		
Siam	C		1															
South-West Africa[5]																		
Syria: Beirut	C	2																
Union of South Africa																		
Cape Province	C					5	10	3				3						
Orange Free State	C												1					
Transvaal	C									1								
United States: California																		
San Benito County—Plague-infected ground squirrels			8															
Santa Clara County—Plague-infected ground squirrels										1								
Whittier	C		1															
	D		1															
On vessel: S S Angkor at Beirut from Marseille	C				1													

[1] Including plague in the United States and its possessions

[2] A report dated Nov 13, 1933, states that plague was reported in Manchuria, China, as follows Fengtien Province, 249 cases, Hsingan Province, 200 cases, Jehol Province, 81 cases; Kirin Province, 479 cases

[3] For 2 weeks

[4] Imported.

[5] 116 cases of plague with 5 deaths were reported in Ovamboland, South-West Africa from Jan 1 to Dec 2, 1933. Antiplague measures have been taken.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases, D, deaths, P, present]

Place		July 1933	August 1933	September 1933	October 1933	November 1933	December 1933
Argentina	C	7			6	4	
	D	3			2	1	
Bolivia	C	25	1			5	
British East Africa (see also table above):							
Kenya	C	3	13	26	20	36	14
Uganda	C	47	91	97	71	83	
Ecuador	C			3			
Indo-China (see also table above):							
Cambodia	D	3	6	16	8	2	1
Cochin-China	C	2	5	1			1

Place		July 1933	August 1933	September 1933	October 1933	November 1933	December 1933
Madagascar	C	133	100	77			
	D	132	92	73			
Peru	C	6	7	8	18	19	12
Callao	C			1	7		
Senegal							
Dakar [6]	C	57		5	4	15	3
	D	39		3	9	10	3
Medina [6]	C	31			1	1	1
	D	23			1	1	1
Tivaouane [6]	C		5	2			

[6] Incomplete reports.

SMALLPOX

[C indicates cases, D, deaths; P, present]

Place		June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Oct 1–28, 1933	Week ended— November 1933: 4	11	18	25	December 1933: 2	9	16	23	30	January 1934: 6	13	20	27	Feb 3, 1934
Algeria:																			
Algiers Department	C	2					1												
Constantine Department	C	1																	
Angola. (See table below)																			
Belgian Congo	C	5		4											4				
Bolivia (See table below.)																			
Brazil:																			
Porto Alegre (alastrim)	C	1	1	12	5	1				1									
Santos	C													4		2			
British East Africa: Tanganyika	C	6	21	30	52	26	33	132	11	6	22	14	16						

British South Africa																			
Northern Rhodesia	C	1	1		16														
Southern Rhodesia	C	1		2															
Canada																			
Alberta	C													1					
Manitoba	C		1																
Ontario	C							1											
Prince Edward Island	C									[1] 1									
Quebec	C									1						1			
Saskatchewan	C			1															
Ceylon																			
Colombo	C	6	9				1												
Galle	C	1																	
China:																			
Canton	C					1		1		1	1	1	2	1	5	5	3		
Dairen [2]	C	3		1	3	2	3	7	5	35	28	18							
Foochow	C	P																	
Hangchow	C	3	1						1			1	1						
Hankow	C			3						1	1								
Hong Kong	C	3	1						1			1	1				1	2	
Nanking	C	2								1									
Shanghai	C	22	10	5	3	4	1	6	6	3	6	10	17	21	12	29	27	40	
Swatow	C				2	1													
Tientsin	C	2												1					
Chosen (See table below)																			
Colombia Buenaventura	D	1																	
Costa Rica (See table below)																			
Dahomey (See table below)																			
Ecuador (See table below)																			
Egypt																			
Alexandria	C					1	2								1	1		2	1
Asyut	C	112	109	43	40		1		6	11		9	9	1		3			
Beni-Suef	C			31	13														
Cairo	C	1		1									1						
Dakahliya	C	4	1									1	32	24		7			
Faiyum	C	44	18	3	1				13			3							
Gharbiya	C	83	39	5	2		4	3		3		4	1						
Girga	C	2	2		9					16		4				6			
Minya	C												10	22		48			
Qena	C	9	25	4	25		6	2	20	7		11	5	1		5			
Provinces	C	499	297	150	95	25		38	105	65	55	39	58	48	117	77			
Great Britain:																			
England and Wales	C	55	32	20	10	1	1	1	6	3	9	4	9	2	3	13	7	9	
London	C	40	28	14	10	1	1	1	6	3	9	4	9	2	3	13	7	8	
London and Great Towns	C	49	31	15	10	1	1	1	6	3	9	4	9	2	3	13	7	9	
Greece (see also table below). Salonika	C	8		9															

[1] For 2 weeks
[2] A report dated Feb. 3, 1934, states that 300 cases of smallpox with 100 deaths have occurred in Dairen, Manchuria, China, since November 1933

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths; P, present]

Place		June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Oct 1–28, 1933	Week ended— November 1933 4	11	18	25	December 1933 2	9	16	23	30	January 1934 6	13	20	27	Feb. 3, 1934
India	C	14,599	7,069	7,052	4,699	1,218	1,254	1,317	1,888	2,047	1,978	2,077	2,048						
	D	4,256	1,768	1,625	1,079	281	269	299	383	500	424	497	522						
Bassein	C	9	10	19	12	5	3	2	2	4	1	10	1	17	9	11	7	18	
	D	8	6	6	7	1	1	3	1	3		3	2	3	8	3	1	8	
Bombay Presidency	C	1,942	1,029	873	599	121	161	117	274	232	227	273	328	325	411				
	D	376	186	160	91	22	43	15	35	40	35	60	80	71	74				
Bombay	C	34	14	1	4		2		2	3	2	2	5	8	4	6	8	13	
	D	25	8	1	4		2		1	3	2	1	2	5	1	2	4	4	
Calcutta	C	59	18	10	8	1	8		4	9	8	9	6	43	31	42	46	62	
	D	49	8	3	3	1	1		3	1	5	6	4	26	20	24	34	37	
Cochin	C	4		2	1											5	6	1	
Karachi	C	16	5		2			1			2		1	1	3	4	4	4	
Madras Presidency	C	3,571	2,851	2,944	2,432	697	545	533	704	637		611	617						
	D	726	587	513	507	121	99	111	116	110		101	75						
Madras	C	234	223	209	81	13	7	7	14	14	17	13	11	28	20	22	51	20	
Negapatam	C	12	21	8	9	7		3	7	8	5	3	3	1			3	1	
Rangoon	C	4	1	4	1		1		1	2	1	2	3	1	4	5	1	4	
Tuticorin	C		2		1	5			1								4		
Vizagapatam	C	14	11	2	1	1			1		1	1	1			1	1	2	
India (French):																			
Chandernagor	D	1																	
Karikal	C			1	1			1	2	3		1	6	1					
	D			1	1			1	2	1		1	3	1					
Pondichery	C	139	181	210	101	15	22	19	15	26	10	14	18	25					
	D	73	70	104	63	7	10	9	6	12	8	10	9	11					
Indo-China (see also table below): Saigon and Cholon	C	1		1								1							
Iraq	C	17	22	8	36	10	2	10	113	3	28	3			10	7			
Baghdad	C				2			1	2	1	1	1			1		1		
Basra	C			4		3						1							
Japan:																			
Kobe	C	1																	
Tokyo	C	45																	

Mexico (see also table below).																			
Juarez [1]																			
Mexico, D F	C	1	12																
Monterrey	D		1			1							1						
Saltillo	D												1	1					
San Luis Potosi	D	9	8													1			
Tampico	C														1	1			
Torreon	D			1	2														
Vera Cruz	C				1		1												
Morocco. (See table below)																			
Nigeria	C	675	361	113	166	268	103		[1] 138	57			127						
Nyasaland. (See table below)																			
Palestine	C	13																	
Paraguay: Asuncion	D	3																	
Persia	C	26	20	10	45			6	6	6	3	16							
	D	9	7	11	5	2		2	1	1	1								
Teheran	C	21	17	3	11		2	3	3		1	2							
	D	8	5	1	4	2					1	1							
Peru. (See table below)																			
Poland	C	1			1		1												
Portugal (see also table below)																			
Lisbon	C	5	3	3					1						4		1		
Oporto	C	3	1		2	1	1												
Siam	D	5	1																
Sierra Leone	C	45	6	250	534		[1] 530		[1] 48		[1] 84		[2] 172						
Spain	C	59	29	16	11	27	13								3	7			
Sudan (Anglo-Egyptian)	C	5		1				14	1		15	5	1	40	17		8	9	13
Syria:																			
Beirut	C	14	21										12	8	12	20	19	10	12
Provinces	C	9	11	7	34	2	19	14		6	18		19	1	11	10	11	30	
Turkey. (See table below)																			
On vessels.																			
S.S. Arracan at Newport	C		1																
S.S. Clan Macquarrie at Suez	C			1															
S.S Sikh at Madras	C		1																
S.S Lichtenfels at Suez from Calcutta	C			1															
S.S. Shahjehan at Madras	C			1															
S.S Rohna at Penang from Madras	C					1													
S S. Enterprise at Karachi	C										1								
S S. Jaldurga at Rangoon from Gogalpore	C										1								
S S. Pembrokeshire at Hong Kong	C											P							
S S. Cremer at Singapore from Penang and Belawan	D													1					

[1] Dec. 18, 1933: 90 cases of smallpox were reported in Juarez, Mexico, with 18 deaths occurring from Dec 1 to 16, 1933
[2] For 2 weeks

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths, P, present]

Place		July 1933	August 1933			September 1933			October 1933			November 1933			December 1933
			1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20	21–31	1–10	11–20	21–30	1–10
Dahomey	C	3	6	1	1	20	6	1	2	8	15	9	9	5	
	D	1		1	1	5	1			6		6	6		
Indo-China (see also table above)	C	105	20	38	21		44	37	39	20	78	24	22	11	54
	D	37	5	15	3		19	13	15	5	18	10	8		10

Place		July 1933	August 1933	September 1933	October 1933	November 1933	December 1933
Angola	C			4			
Bolivia	C	10	12	15	34	39	21
Chosen	C	3					
Costa Rica	C		2			3	
Ecuador	C	12	1				
Greece (see also table above)	C		1		1	2	
Mexico (see also table above)	C	9	31	18			
Morocco	C	8	1	2	3	16	
Nyasaland	C	336	347	318	289		
Peru	C	84	56	90	23	21	
Portugal (see also table above)	C		89	105	214	323	
	D		16	27	31	21	
Turkey	C		8	56		12	17

TYPHUS FEVER

[C indicates cases, D, deaths, P, present]

Place		June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Week ended— Oct 1933 7	Oct 14	Oct 21	Oct 28	Nov 1933 4	Nov 11	Nov 18	Nov 25	Dec 1933 2	Dec 9	Dec 16	Dec 23	Dec 30	Jan 1934 6	Jan 13	Jan 20
Algeria:																				
Algiers Department	C	7	2			1							9							
Constantine Department	C	66	21	16	1		4				1	7	1	2	3		1	2	6	1
Bone	C	1	1						1									1	1	
Oran Department	C	2		2				1					1							
Basutoland (See table below)																				
Bolivia (See table below)																				
British East Africa: Uganda	C	4	4	11		1	1		1	1										
Bulgaria	C	2	3	1			3		1		1	1	3			5				
Chile	C		1,028	2,588				[1] 2,620												
Antofagasta	C																4			
San Pedro [2]																				
Santiago	C	1,112	392	1,071	224	292	343	300	244	335	335	297	262	286	200	213	195			
Valparaiso	C	7	13	34	4	8	22	9	5	12	24	13	11	8	17	11	11	4	5	
China:																				
Hangchow	C		5																	
Hankow	C			1								1	1							
Harbin	C		11	1																
Nanking	C	1	1		1															
Shanghai	C	1	1	1				1	1				2				1			
Tientsin	C	1																		
Chosen (See table below)																				
Czechoslovakia (See table below)																				
Egypt:																				
Alexandria	C	18	1	1												1	1			
Asyut	C		2									1			1					
Beheira	C	257	61	18	8	5	2	9	9		10	24	1	25	28	20	39		28	
Cairo	C	9	4	1																
Dakahliya	C	82	42	14						2	2	3	5		1	6	2		12	
Damietta	C	3	1	1												1				
Gharbiya	C	310	79	41	1	1	8			3	5	12	14	6	25	16	44		64	
Minufiya	C	52	36	6	3	5	2	2	2	3				5	6	5	10		8	
Qena	C			9			3			3	2	1	2							
Provinces	C	785	226	107	13	12	15	12	14	29	20	45	27	38	62	49	102	110	116	

[1] For 4 weeks

[2] Incomplete reports from San Pedro, Chile, for the month of November 1933 show 113 cases of typhus fever.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases, D, deaths, P, present]

Place		June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Week ended— October 1933				November 1933				December 1933					January 1934		
						7	14	21	28	4	11	18	25	2	9	16	23	30	6	13
Greece (See table below.)																				
Guatemala (See table below)																				
Hungary	C						5		10											
Iraq:																				
Amara	C			1			4													
Baghdad	C	2	1																	
Ireland, Northern: Londonderry	C																1			
Irish Free State																				
Kerry County—Dingle	C					4			4											
Waterford County—Lismore	C		1																	
Japan:																				
Kobe	C							1												
Osaka	C										1									
Latvia (See table below)																				
Lithuania	C	1	11										12	3	9		9			
Mexico (see also table below)																				
Mexico, D F	C	6	1	16	5	3	6		14	15	10	7	6	8	13	19				
San Luis Potosi	D			1	1														1	
Torreon	C		1	2						1		2								
Morocco	C	14	12	2	1	1								2			5	1	2	1
Palestine	C	20	3	3				4	4							2				
Persia	C	21	15	24	8	5	6	1	5	5	1						3			
Peru. (See table below)																				
Poland	C	196	66	51	17	8	23	18	34	41	21	24	51	47	64	93	79	97	99	
	D	11	6	1	2	1		2	3		2	5	4	4	4	4	3	6	6	
Rumania (See table below)																				
Spain: Madrid	C			2	1															
Syria	C	1	2												15					
Trans-Jordan	C	2																		
Tunisia:																				
Tunis	C			1		2													1	1
Provinces	C	36																		
Turkey (See table below)																				
Union of South Africa (See table below)																				
Yugoslavia (See table below.)																				

Place		July 1933	August 1933	September 1933	October 1933	November 1933	December 1933
Basutoland	C	208	279	259		366	
Bolivia	C	36	34	99	129	39	88
Chosen	C	59			3	8	
Czechoslovakia	C	6	1		1	12	
Greece	C	5	4	4	3	5	
Guatemala	C	1	4	5		6	5
Latvia	C		1				
Mexico (see also table above)	C	12	19	42			
Peru	C	20	60	84	55	341	

Place		July 1933	August 1933	September 1933	October 1933	November 1933	December 1933
Rumania	C	57	22	13	28	35	
Turkey	C	5	7	9	20	23	27
Union of South Africa							
Cape Province	C	195	135	141	166		
Natal	C	23	18	43	42		
Orange Free State	C	61	140	180	183		
Transvaal	C	5	3	103	24		
Yugoslavia	C	89	33	5	38	13	66

YELLOW FEVER

[C indicates cases, D, deaths, P, present]

Place		June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Week ended— October 1933				November 1933				December 1933					January 1934	
					7	14	21	28	4	11	18	25	2	9	16	23	30	6	13
Brazil:																			
Ceara State St Mathew	C		1																
	D		1																
Pernambuco State																			
Granito	C	2																	
	D	2																	
Novo Exu [1]	C	1																	
	D	1																	
French West Africa																			
Guinea	C			[2] 1											2			2	
Niger Territory	C		2	3	1			1											
	D		2	2	[3] 2			1											

See footnotes at end of table

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER—Continued

[C indicates cases; D, deaths, P, present]

Place		June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Week ended— October 1933: 7	14	21	28	November 1933: 4	11	18	25	December 1933: 2	9	16	23	30	January 1934: 6	13
Gold Coast:																			
Dunkwa	C																		1
	D																		1
Keta	C																	1	
N'Kaw Kaw	C												1						
Togoland	C			[2] 1		[2] 1				1									
	D			[3] 1						1									
Ivory Coast: Abengourou	C															1			
	D															1			
Nigeria., Kano	C								1										
	D								1										
Senegal:																			
Bakel	C			2		1													
	D			2		1													
Birkelane	C												2						
	D												1						
Dakar	C										1								
	D										1								
Kaffrine	C					1													1
	D					1													1
Kaolak	C												1						
	D												1						
St. Louis	D	[4] 1																	
Sebikotane	C										1			1					
	D										1			1					

[1] 2 cases of yellow fever with 2 deaths were reported in Novo Exu, Pernambuco State, Brazil, during the month of June 1933.
[2] Suspected
[3] Includes 1 suspected death.
[4] Imported.

X

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 9

MARCH 2 - - - - - 1934

IN THIS ISSUE

A Study of Mortality Among the Native Races of Alaska
Agglutination of Proteus X in Rocky Mountain Spotted Fever
Deaths in Large Cities During the Week Ended February 10
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R. C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law. United States Code, title 42, sections 7, 30, 93; title 44, section 220

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CONTENTS

Page

Mortality in the native races of the Territory of Alaska, with special reference to tuberculosis ---- 289

Further observations on the agglutination of proteus X strains in Rocky Mountain spotted fever (II) ---- 298

Court decision on public health ---- 312

Deaths during week ended February 10, 1934

Deaths and death rates for a group of large cities in the United States ---- 313

Death claims reported by insurance companies ---- 313

PREVALENCE OF DISEASE

United States

Current weekly State reports.

Reports for weeks ended Feburary 17, 1934, and February 18, 1933 ---- 314

Summary of monthly reports from States ---- 316

Weekly reports from cities

City reports for week ended February 10, 1933 ---- 317

Foreign and insular·

Canada—Quebec Province—Communicable diseases—Two weeks ended February 10, 1934 ---- 320

Cholera, plague, smallpox, typhus fever, and yellow fever:

Cholera ---- 320

Smallpox ---- 320

PUBLIC HEALTH REPORTS

VOL. 49 MARCH 2, 1934 NO. 9

MORTALITY IN THE NATIVE RACES OF THE TERRITORY OF ALASKA, WITH SPECIAL REFERENCE TO TUBERCULOSIS

By F S. FELLOWS, *Passed Assistant Surgeon, United States Public Health Service,* and *Director, Alaska Medical Service*

Soon after arrival in Alaska in the fall of 1931, to take over the duties in connection with the direction of the health work being done among the natives of Alaska, the writer made inquiry for statistics concerning the death rates from various diseases in the Territory. This inquiry revealed that no satisfactory statistics were available, and that they had never been compiled in an acceptable form, although deaths had been recorded for many years. In order to secure some information concerning death rates in the Territory, the available records were gathered, tabulated, and placed in the form herewith presented.

Alaska is divided into four judicial divisions, primarily for law-enforcement purposes, and all death certificates are filed according to the division in which the deaths occur These divisions are shown on the map of Alaska, presented in figure 1.

Deaths have been reported to the Territorial auditor since 1927, and for several years previous to that time to the secretary of the Territory of Alaska. The reports are on file alphabetically by year and judicial division. A 5-year study was considered desirable, and the death certificates were examined for the years 1926–30, inclusive.

Death certificates in Alaska are filled out by some interested person in the village or city where the death occurs. In the larger cities and in other places where a physician is located, it is, of course, the physician's duty to complete the certificate. The Bureau of Indian Affairs maintains 20 nurses in the larger native villages scattered throughout the Territory. The various mission boards maintain nurses in several of the villages where no Government nurse is stationed. It is frequently necessary for these nurses to diagnose conditions, treat the sick natives, and, if death occurs,

complete the death certificate In still other villages the teacher, trader, missionary, or even the parents of the deceased must attend to the completion and filing of the certificate. After completion it is recorded by the nearest United States commissioner and forwarded by him to the auditor of the Territory for final check and filing. For the Territory as a whole, about two fifths of the death certificates are completed by persons other than physicians or nurses, and in the northern divisions the percentages completed by lay persons are even larger In southeastern Alaska about three fourths of the certificates are filed by physicians, the remainder being filed mostly

JUDICIAL DIVISIONS OF ALASKA

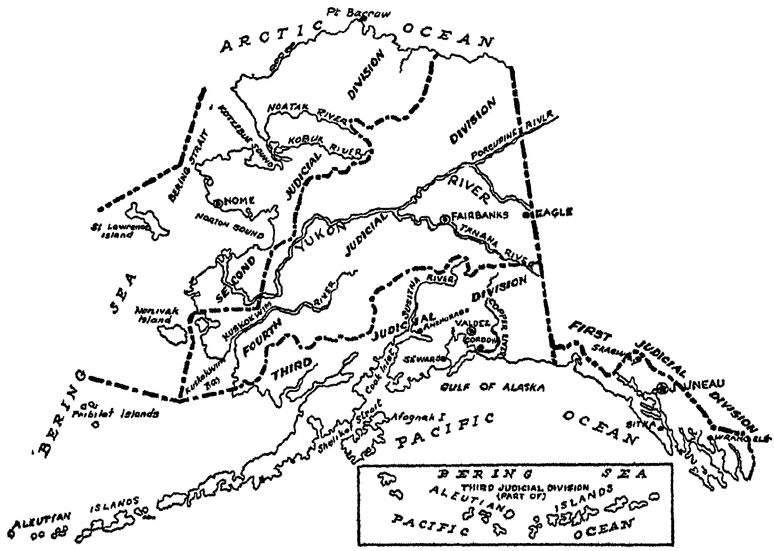

FIGURE 1.

by nurses. The statement of the cause of death is necessarily less reliable for the northern districts.

Before entering into a discussion of the various causes of death some explanation of the characteristics of the population of Alaska may be made. The official United States census for 1930 shows that approximately 60,000 people reside permanently within the boundaries of the Territory. This population may be roughly divided into one half native and one half white and other races. Table 1 gives the figures as obtained from the census reports. In tabulating the deaths, and in the census reports, a native was considered as anyone who claimed any degree of Indian, Aleut, or Eskimo blood.

TABLE 1.—*Mortality from all causes among the native Indians and Eskimos and the white and other population of Alaska during the 5 years 1926–30*

	All Alaska	Judicial division			
		1	2	3	4
Population according to United States census of Oct 1, 1929					
All races	59,278	19,304	10,127	16,309	13,538
Native Indians and Eskimos	29,983	5,990	8,686	7,298	8,009
White	28,640	12,877	1,427	8,848	5,488
Other	655	437	14	163	41
Number of deaths from all causes during the 5 years					
All races	4,572	1,565	860	1,143	1,004
Native Indians and Eskimos	2,767	755	775	556	681
White	1,704	755	83	546	320
Other	101	55	2	41	3
Average annual death rate from all causes per 1,000 population:					
Native Indians and Eskimos	18.5	25.2	17.8	15.2	17.0
White	11.9	11.7	11.6	12.3	11.7
Number of deaths from all causes reported by—					
Physicians	2,293	1,120	194	614	365
Nurses	409	187	120	19	83
Others	1,870	258	546	510	556
Percentage of deaths from all causes reported by—					
Physicians	50.2	71.6	22.5	53.7	36.4
Nurses	8.9	11.9	14.0	1.7	8.3
Others	40.9	16.5	63.5	44.6	55.3
Number of tuberculosis deaths	1,073	298	258	240	277
Number reported by—					
Physician or nurse	629	258	119	119	133
Others	444	40	139	121	144
Percentage reported by—					
Physician or nurse	58.6	86.6	46.1	49.6	48.0
Others	41.4	13.4	53.9	50.4	52.0

The white population of Alaska is found chiefly in the larger cities; but white traders, missionaries, and school teachers live in practically every village. A large proportion of the white people live in southeastern Alaska, another large group in the seaport cities south of the Alaska Peninsula, and a third large group in the territory adjacent to the Alaska railroad. Other smaller groups are to be found in the various mining and fishing cities scattered throughout the Territory. It may be noted that the number of white people in the judicial divisions decreases as we go north, while the native population increases. Fishing, mining, agriculture, and seafaring furnish work for a large percentage of the white people. Most of the industries give work to single men; and it is noted in the 1930 census report that there were 228 white males for each 100 white females.

The native population in Alaska, as in the United States, is becoming mixed with the whites and other races. Figure 2, based on the 1930 census of Alaska, shows the increasing amount of mixed bloods among the younger natives. The natives of Alaska are to be found in all inhabited sections. Villages exist from Metlakatla in the south, to Barrow in the extreme north, and from Eagle on the Yukon River near the Canadian border, to Attu in the eastern hemisphere. The mixing of population is especially noticeable in southeastern Alaska and in the fishing and mining districts. In the more isolated sections the predominance of pure native blood among the inhabitants is easily recognizable.

The scarcity of old natives, the large number of children born to each native mother, and the large number of children seen in the native villages, together with the large number of deaths among the children suggested a comparison of the percentage of population in

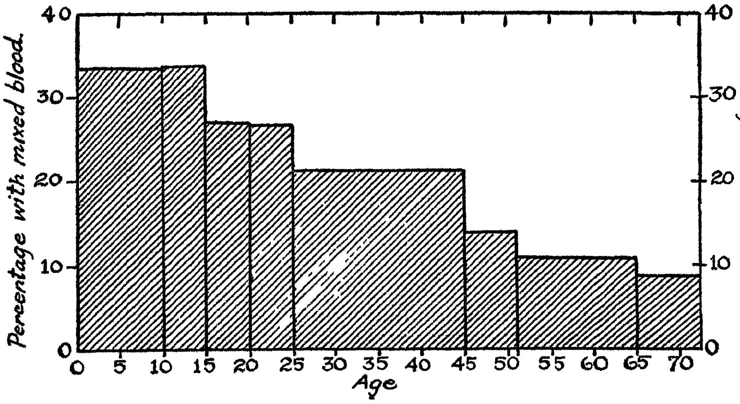

FIGURE 2.—Percentage of native Alaskan Indian and Eskimo population with mixed blood, by specific ages, 1930. (From the 1930 Census of Outlying Territories, p 21 U S Bureau of the Census, Department of Commerce Government Printing Office, Washington)

each age group. Figure 3, based on the 1930 census of Alaska, presents this comparison graphically. From this chart it can readily be seen that a large percentage of the native deaths occur before the age 20.

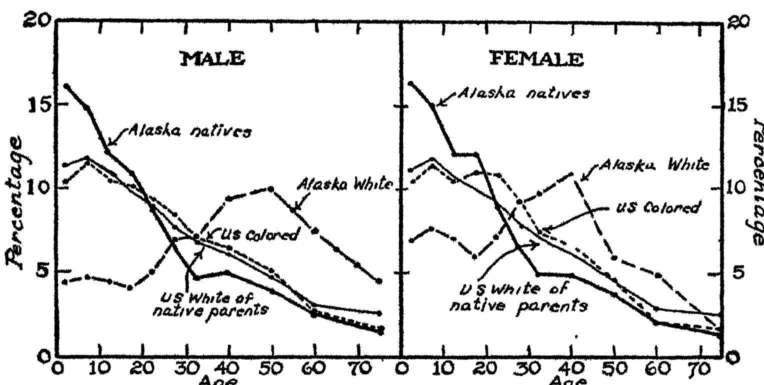

FIGURE 3.—Percentage of various racial groups in each 5-year age group according to the census of 1930. (For ages above 35, data are available in 10-year groups only These 10-year groups for the older ages have been divided by 2 to make them comparable with 5-year age groups) (From the 1930 census of the United States and Alaska)

The total deaths and the death rates are shown by race and judicial division in table 1. In the First Division, southeastern Alaska, the average annual death rate in the 5-year period among the native Indians and Eskimos is 25 per 1,000, as compared with 12 per 1,000

among the whites. In the other divisions the reported death rate among the native races ranges from 15 to 18 per 1,000, but the scattered population, absence of physicians and nurses, and other circumstances make for incomplete registration of deaths. It is probable that the death rate in southeastern Alaska more nearly represents the true rate among natives in the whole territory than the incomplete reports for the other districts.

TABLE 2.—*Actual and relative mortality from important causes among the native Indians and Eskimos and among the white population of Alaska, during the 5 years, 1926–30*

Judicial division, and race	All causes	Tuberculosis (all forms)	Pneumonia (all forms)	Influenza	Accidents	Cardiac	Cerebral hemorrhage	Malignancy	Gastrointestinal	Suicide	Senility	Unknown	All other causes
	Average annual death rate per 100,000												
All Alaska.													
Native [1]	1,846	655	160	122	103	63	15	24	51	6	71	165	408
White	1,190	56	57	15	202	226	103	89	32	52	38	36	284
1st division													
Native [1]	2,521	888	271	50	160	130	37	70	57	10	154	130	564
White	1,173	42	68	23	177	213	121	92	28	28	34	25	322
2d division													
Native [1]	1,785	592	161	81	101	62	16	14	92	7	58	159	442
White	1,163	14	14	0	224	294	154	126	14	42	56	42	182
3d division.													
Native [1]	1,524	532	121	49	85	38	8	22	27	6	52	154	430
White	1,234	90	52	9	240	224	81	75	52	81	34	32	265
4th division													
Native [1]	1,701	662	112	287	80	38	5	3	25	3	43	210	235
White	1,166	44	51	7	193	241	84	98	15	66	47	66	255
	Percent of all deaths due to indicated cause												
All Alaska													
Native [1]	100.0	35.5	8.7	6.6	5.6	3.4	0.8	1.3	2.8	0.3	3.9	9.0	22.1
White	100.0	4.7	4.8	1.2	17.0	19.0	8.7	7.5	2.7	4.4	3.2	3.0	23.9
1st division													
Native [1]	100.0	35.2	10.7	2.0	6.4	5.2	1.5	2.8	2.3	.4	6.1	5.2	22.4
White	100.0	3.6	5.8	2.0	15.1	18.1	10.3	7.8	2.4	2.4	2.9	2.1	27.4
2d division													
Native [1]	100.0	33.2	9.0	4.5	5.7	3.5	.9	.8	5.2	.4	3.2	8.9	24.8
White	100.0	1.2	1.2	0	19.3	25.3	13.3	10.8	1.2	3.6	4.8	3.6	15.7
3d division													
Native [1]	100.0	34.9	7.9	3.2	5.6	2.5	.5	1.4	1.8	.4	3.4	10.1	28.2
White	100.0	7.3	4.2	.7	19.4	18.1	6.6	6.0	4.2	6.6	2.7	2.6	21.4
4th division													
Native [1]	100.0	38.9	6.6	16.9	4.7	2.2	.3	.1	1.5	.1	2.5	12.3	13.8
White	100.0	3.8	4.4	.6	16.6	20.6	7.2	8.4	1.3	5.6	4.1	5.6	21.9
	Number of deaths												
All Alaska													
Native [1]	2,767	982	240	183	155	95	23	36	77	9	107	248	612
White	1,704	80	82	21	289	323	148	128	46	75	54	51	407
1st division													
Native [1]	755	266	81	15	48	39	11	21	17	3	46	39	169
White	755	27	44	15	114	137	78	59	18	18	22	16	207
2d division.													
Native [1]	775	257	70	35	44	27	7	6	40	3	25	69	192
White	83	1	1	0	16	21	11	9	1	3	4	3	13
3d division.													
Native [1]	556	194	44	18	31	14	3	8	10	2	19	56	157
White	546	40	23	4	106	99	36	33	23	36	15	14	117
4th division.													
Native [1]	681	265	45	115	32	15	2	1	10	1	17	84	94
White	320	12	14	2	53	66	23	27	4	18	13	18	70

[1] Including all Indians and Eskimos.

Death rates from important causes among the natives and the whites are shown in table 2 and figure 4 Among the native Indians and Eskimos tuberculosis stands out far above any other cause of death, with a death rate of 655 per 100,000 for the whole native population of Alaska In the southeastern division, where deaths are more completely reported, the rate is 888 per 100,000 natives. Tuberculosis constitutes 35 percent of all deaths among the natives, a figure which does not vary greatly in the different divisions.

The relative preponderance of young natives and old white people in Alaska is shown in figure 3. The large number of deaths from

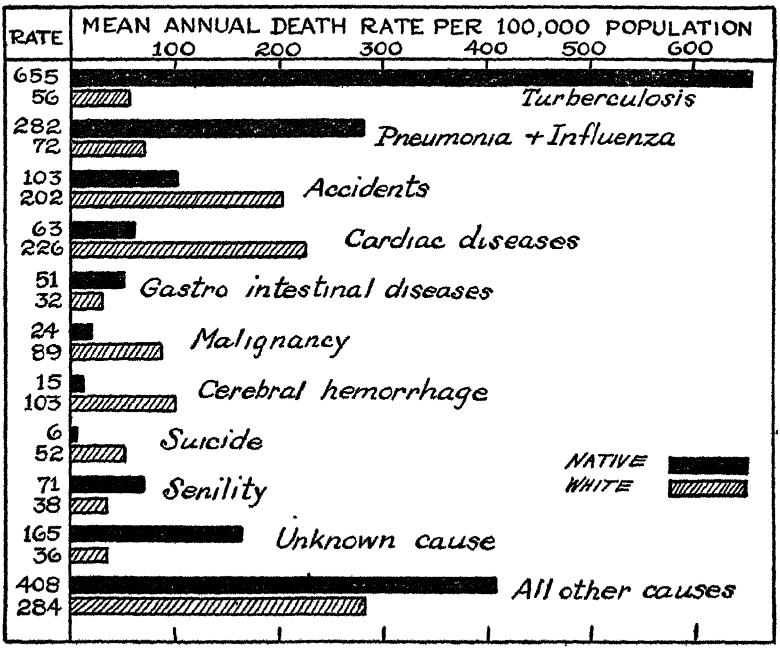

FIGURE 4 —Mortality from important causes among native Indians and Eskimos and among whites in Alaska during the years 1926-1930

cardiac diseases, malignancy, and cerebral hemorrhage in the white population is therefore to be expected. The large number of accidental deaths among the whites when compared with the natives is due chiefly to the fact that a great many white men are engaged in hazardous occupations, such as mining and seafaring. The native, who lives more or less by fishing and hunting, is not exposed to the dangers connected with more hazardous occupations.

Deaths from unknown causes are much higher in the native than in the white population, because many natives die away from contact with a physician or nurse, and the person completing the death certificate hesitates to make a statement as to the cause of death when

he is not familiar with the symptoms of the various diseases. It is interesting to note that 69 percent of the deaths among the natives classified as cause unknown occurred in children under 20 years of age.

Suicide is a fairly common cause of death among the white population and is much higher in Alaska than in continental United States. The Mortality Statistics for 1929, issued by the Bureau of the Census, Department of Commerce, show the rate in the United States to be 14 per 100,000 population. The average rate among whites in Alaska during the years 1926–30 was 52 per 100,000. Many white men come to Alaska with the idea of making a fortune, and as failure is more usual than success, a great many of them resort to suicide as the easiest way out of their plight. Pat O'Cotter has apparently, although perhaps undesignedly, stated the reason for the high suicide rates in the following lines:

> The lure of the Land had gripped him,
> The Land where you die if you fail;
> The Land of the fabled fortune,
> The Land of the endless trail,
> The Land of the lonely silence,
> The Land of the cruel cold,
> The Land of the lost ambitions,
> Alaska, the Land of Gold.

Table 2 shows also for both natives and whites the percentage of all deaths that were due to each cause. Percentages as well as the rates are more reliable for southeastern Alaska for the reason that a large proportion of the deaths in this district (72 percent) have been reported by physicians. With reference to most of the diseases, and to tuberculosis especially, one can see that the percentages for the other districts compare closely with those from southeastern Alaska, Judicial Division No. 1. The one large discrepancy is found in the deaths listed for influenza This is explained by an influenza epidemic that occurred in Judicial Division No. 4 in 1927 and did not extend into any of the other divisions.

TABLE 3 —*Annual mortality from tuberculosis (all forms) among the native Indians and Eskimos and the white population of Alaska, 1926–32*

Judicial division and race	Total, 1926–30	1926	1927	1928	1929	1930	1931	1932
	Annual death rate per 100,000							
All Alaska:								
Native Indians and Eskimos	655	644	590	600	694	747		
White	56	77	59	49	45	49		
1st division:								
Native Indians and Eskimos	888	1,052	818	751	918	902	1,119	1,302
White	42	31	70	31	31	47	93	78
2d, 3d, and 4th divisions:								
Native Indians and Eskimos	597	542	534	563	638	709		
White	67	114	51	63	57	51		

TABLE 3.—*Annual mortality from tuberculosis (all forms) among the native Indians and Eskimos and the white population of Alaska, 1927–32*—Continued

Judicial division and race	Total, 1926–30	1926	1927	1928	1929	1930	1931	1932
	Number of deaths							
All Alaska								
Native Indians and Eskimos	982	193	177	180	208	224		
White	80	22	17	14	13	14		
1st division								
Native Indians and Eskimos	266	63	49	45	55	54	67	78
White	27	4	9	4	4	6	12	10
2d division								
Native Indians and Eskimos	257	47	51	58	44	57		
White	1	0	1	0	0	0		
3d division								
Native Indians and Eskimos	194	34	28	39	43	50		
White	40	14	4	8	8	6		
4th division								
Native Indians and Eskimos	265	49	49	38	66	63		
White	12	4	3	2	1	2		

TABLE 4.—*Mortality from tuberculosis (all forms) of males and females of different ages in the native Indian and Eskimo population of Alaska, 1926–30*

Age	All Alaska			1st judicial division			2d, 3d, and 4th judicial divisions		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Average annual tuberculosis death rate per 100,000								
All ages	655	633	678	888	814	964	597	589	606
Under 1	934	979	885	1,881	2,366	1,468	702	685	722
1 to 9	444	503	382	711	759	664	382	447	315
10 to 19	610	553	667	941	883	996	536	481	591
20 to 29	936	744	1,134	1,373	1,059	1,704	826	663	993
30 to 39	743	639	851	499	179	850	809	768	851
40 to 49	580	530	634	735	704	769	540	486	599
50 to 59	605	708	488	567	451	697	617	782	424
60 and over	588	819	305	782	1,116	412	513	711	260
	Number of deaths								
All ages	982	486	496	266	123	143	716	363	353
Under 1	48	26	22	19	11	8	29	15	14
1 to 9	184	106	78	55	29	26	129	77	52
10 to 19	216	98	118	61	28	33	155	70	85
20 to 29	213	86	127	63	25	38	150	61	89
30 to 39	111	49	62	16	3	13	95	46	49
40 to 49	77	37	40	20	10	10	57	27	30
50 to 59	56	35	21	12	5	7	44	30	14
60 and over	43	33	10	16	12	4	27	21	6
Unknown	34	16	18	4		4	30	16	14

As tuberculosis is the most important cause of death among the native population of Alaska, some further data on this cause seem desirable. Rates based on the reported deaths during the 5-year period under study are reasonably similar for divisions 2, 3, and 4, but are higher for southeastern Alaska, probably because of more accurate reporting. Table 3 shows rates by years from 1926 to 1932 for Division No. 1 and from 1926 to 1930 for all Alaska except Division No. 1. The periods are too short to give much information about the trend, but there is a suggestion of a rising rate, particularly in south-

eastern Alaska for 1931 and 1932 Data from the other districts for these 2 years are not yet available.

Figures submitted for the number of tuberculosis deaths among the natives are probably low, owing to the fact that many of the deaths listed as unknown occurred in children under 20 and no doubt a large percentage of these was due to tuberculosis. Other deaths listed as cold, fever, convulsions, meningitis, etc , might well have been

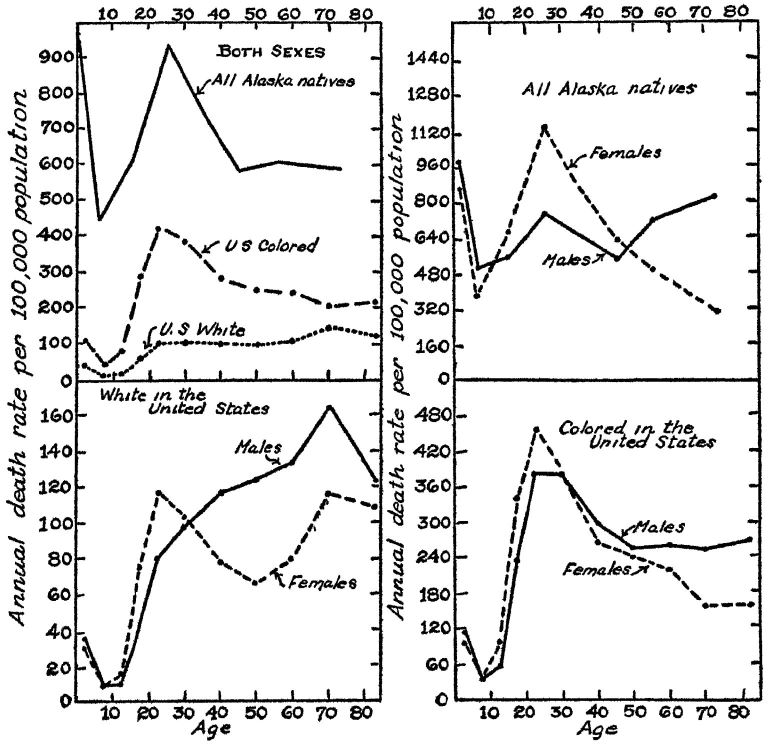

FIGURE 5 —Tuberculosis mortality at specific ages among Alaskan native Indians and Eskimos during the period 1926–30, with comparative data for colored and white persons in the United States during 1927

tuberculosis. The number of incorrectly diagnosed tuberculosis deaths should not equal the number of tuberculosis deaths incorrectly listed under the above causes.

The figures submitted for the tuberculosis deaths among the white population of Alaska probably do not tell a true story. This is due to the fact that most of the white people contracting the disease in Alaska go "outside" for treatment as soon as a diagnosis is made and never return. This is, of course, impossible for the native people.

Figure 5 shows tuberculosis mortality by age and sex for the Alaska natives and for colored and white persons in the United States, as

given in "Facts and Figures about Tuberculosis," by Jessamine S. Whitney. In the upper left section of figure 5, rates for both sexes are shown by age for the three groups. The rates for Alaskan natives are far above even the colored population of the United States In the other three sections of the chart, rates for males and females of each group have been plotted on scales appropriate for comparing the two sexes rather than comparison from one racial group to another. In both the white and colored population of the United States, tuberculosis mortality above 30 years of age is higher among males than females. In the Alaskan natives the rates are distinctly higher for females from 10 to 50 years of age.

In presenting this article, the purpose is to give the mortality picture as accurately as the data will permit; it is not within the scope of this paper to discuss methods for correction of existing conditions. It might be said, however, that the poor economic conditions, the unhygienic methods of living, ignorance, superstitions, difficulties of communication and travel, expense of transporting supplies, and the lack of interest on the part of most whites and natives in the Territory will probably tend to make an attempt to eradicate tuberculosis from the native a very difficult, tedious, and expensive undertaking.

FURTHER OBSERVATIONS ON THE AGGLUTINATION OF PROTEUS X STRAINS IN ROCKY MOUNTAIN SPOTTED FEVER (II)[1]

By Gordon E. Davis, *Bacteriologist*, R. R. Parker, *Special Expert*, and Mary E. Walker, *Laboratory Assistant, United States Public Health Service*

In a former report (1932) we presented the results of agglutination tests in which 10 strains of *proteus* X were used with 89 Rocky Mountain spotted fever sera, as follows: 36 single serum samples, 21 sera from 9 additional cases, 6 sera from fatal cases, and 26 sera from individuals recovered from 1 month to 33 years

Attention was called to the irregularity with which titers of diagnostic significance were obtained, to the optimum time for securing blood samples as indicated by these tests, and to the relatively high titers obtained with occasional sera when using OX_2 as the test antigen.

The present report concerns similar agglutination tests made during 1932. Eighty-one cases are involved, from 57 of which there were single samples, and from 24, multiple samples. A maximum of 13 strains of *proteus* X were used. Two of these, $X_{19}(1)Z$ and $X_{19}(2)Z$, both Weil strains not formerly used by us, were re-

[1] Contribution from the Rocky Mountain Spotted Fever Laboratory of the United States Public Health Service, Hamilton, Mont.

ceived from Professor Zinsser, of the Harvard Medical School, and the third (N I H. No. 504) (Breinl) was obtained from the National Institute of Health, Washington, D C. These three strains were O variants, while one was an intermediate type uniformly showing only a narrow fringe of growth about a discrete colony. All other X_{19} strains were H variants

For test purposes, 18- to 24-hour growths of these strains on dry agar were suspended in saline and standardized to 500 parts per million (silica standard). The sera were used unheated and without preservative Incubation was at 37° C. for 2 hours, followed by 48 hours in the electric refrigerator. In the tables of results, the upper figures represent the dilution of serum in which there was 100 percent agglutination, the lower give the highest serum dilution in which there was definite agglutination.

TABLE 1.—*The agglutination of proteus X strains by sera from 57 cases of Rocky Mountain spotted fever*

Serum no	Days after onset	Agglutinin titer for proteus X strains						
		OXK	HXK	OX_2	HX_2	OX_{19} (1) Z	OX_{19} (2) Z	OX_{19} (504)
313	1	0	0	0	0	0	0	40
		40	40	20	0	20	0	160
337	3	0	0	0	0	40	0	80
		80	40	40	20	160	160	320
262	3	0	0	0	0	0	0	40
		0	40	0	40	40	0	160
272	4	0	0	0	0	0	0	0
		40	40	20	80	20	0	40
293	4	0	------	0	------	0	0	0
		0	------	0	------	20	0	40
261	5	0	0	------	0	40	40	40
		0	0	------	0	80	80	80
263	5	0	0	0	0	0	0	0
		0	0	0	0	0	0	80
260	6	0	0	0	0	0	0	160
		0	20	0	0	40	0	320
319	6	0	0	0	0	0	0	0
		0	20	20	0	20	20	40
391	6	------	------	------	------	0	0	0
		------	------	------	------	20	20	80
271	7	0	0	0	0	0	0	160
		0	0	0	0	640	320	640
369	7	0	0	0	0	0	0	0
		0	0	20	40	40	40	80
384	7	------	------	------	------	0	0	------
		------	------	------	------	0	20	------
312	8	0	0	0	0	0	0	0
		20	20	20	0	20	40	40
354	8	0	------	0	------	0	0	0
		0	------	20	------	0	0	20
281	9	0	0	0	0	0	0	0
		20	40	0	20	0	20	40
295	9	0	0	0	0	0	40	80
		20	40	20	20	160	160	320
296	10	0	0	0	0	640	640	1,280
		20	20	20	20	2,560	2,560	5,120
347	10	0	0	0	0	320	320	320
		40	40	40	40	640	1,280	1,280
390	10	------	------	------	------	0	0	40
		------	------	------	------	40	40	80
258	11	0	0	0	0	1,280	640	640
		0	0	0	0	2,560	1,280	2,560
349	11	0	0	0	0	0	80	40
		80	80	0	20	40	160	160
373	11	0	0	0	0	160	160	80
		40	80	20	40	320	320	320

See footnotes at end of table.

TABLE 1.—*The agglutination of proteus X strains by sera from 57 cases of Rocky Mountain spotted fever*—Continued

Serum no	Days after onset	Agglutinin titer for proteus X strains						
		OXK	HXK	OX_2	HX_2	OX_{19} (1) Z	OX_{19} (2) Z	OX_{19} (504)
279	12	0	0	0	0	40	80	80
		40	40	20	20	80	160	320
368	12	0	0	0	0	0	0	0
		0	0	0	0	40	40	40
323	13	0	20	0	0	160	80	160
		20	0	0	0	320	160	640
330	13	0	0	0	0	320	160	320
		20	0	0	0	1,280	640	1,280
361	13	0	----	0	0	80	80	40
		80	----	0	0	320	320	80
336	15	0	0	0	0	0	0	40
		0	40	40	40	80	80	160
286	16	0	0	0	0	0	0	0
		20	20	0	0	40	20	80
329	16	0	0	0	0	80	160	160
		20	20	0	0	160	320	640
338	16	0	0	0	0	320	320	320
		40	40	0	0	1,280	1,280	1,280
325	17	0	0	0	0	40	40	160
		20	20	0	0	160	160	320
300	17	0	0	0	0	0	0	0
		20	40	0	0	40	20	80
275	18	0	0	0	0	640	640	640
		80	160	40	40	1,280	1,280	2,560
302	18[1]	0	0	0	0	320	320	320
		20	40	40	40	640	640	1,280
315	18	0	0	0	0	80	160	320
		20	20	0	0	320	320	1,280
335	18	0	0	80	80	2,560	2,560	2,560
		20	40	320	160	10,240	10,240	2,560
326	20	160	160	0	0	1,280	1,280	2,560
		320	320	20	0	2,560	2,560	5,120
278	21	0	0	0	0	0	0	[illegible]
		40	40	40	20	20	0	40
299	21	0	0	0	0	160	80	320
		20	40	40	40	320	320	640
310	21	0	0	0	0	160	320	320
		80	80	20	20	320	640	640
317	21	0	0	0	0	0	0	40
		20	20	0	0	80	40	160
324	21	0	0	0	0	640	320	640
		80	80	0	0	1,280	640	2,560
267	22	0	0	0	0	320	640	640
		20	20	20	40	1,280	2,560	2,560
377	22	0	0	0	0	80	80	80
		0	0	0	0	160	160	320
314	24	0	0	0	0	1,280	640	1,280
		20	20	20	20	2,560	1,280	2,560
339	24	----	----	0	----	0	0	0
		----	----	0	----	80	80	160
346	24	0	0	0	0	0	0	0
		160	160	0	0	20	20	80
284	30	0	0	0	0	80	320	320
		20	20	20	20	320	1,280	640
341	30	0	0	0	0	640	640	640
		40	40	0	0	1,280	2,560	2,560
366	32	0	0	0	0	20	20	40
		80	40	0	0	80	80	80
371	45	0	0	0	0	0	0	160
		0	0	0	0	640	320	640
386	2 months, 16 days	----	----	----	----	0	0	0
		----	----	----	----	20	20	80
363	1 year	0	0	0	----	0	0	0
		0	0	0	----	20	20	40
277	11 years	0	0	0	0	0	0	0
		0	0	0	0	0	0	20
247	13 years	0	0	0	0	0	0	0
		20	40	0	20	20	20	40

[1] Convalescent.

0=Negative in a final serum dilution of 1 20.
----=Not tested.
The upper figures represent the dilution of serum in which there was 100 percent agglutination, the lower give the highest serum dilution in which there was definite agglutination.

Table 2—*The agglutination of proteus X strains by 2 or more sera from each of 24 cases of Rocky Mountain spotted fever*

Serum no	Days after onset	Agglutinin titer for proteus X strains						
		OXK	HXK	OX_2	HX_2	OX_{19} (1) Z	OX_{19} (2) Z	OX_{19} (504)
252 (a)	6	0	0	0	0	0	0	0
		40	40	0	0	0	40	160
(b)	14	0	0	0	0	0	0	40
		80	40	0	0	80	80	160
(c)	21	0	0	0	0	0	0	160
		40	40	20	20	160	320	320
254 (a)	19	0	0	0	0	0	-----	0
		40	40	20	20	40	-----	40
(b)	27	0	0	0	0	40	80	80
		20	80	40	40	80	160	160
256 (a)	14	0	0	0	0	-----	160	640
		0	40	0	0	-----	640	1,280
(b)	29	0	0	0	0	0	0	80
		0	0	0	0	40	40	320
257 (a)	12	0	0	0	0	160	160	640
		0	0	40	40	640	640	1,280
(b)	27	0	0	0	0	0	0	80
		20	40	0	0	80	160	380
259 (a)	7	0	0	0	0	0	0	2
		0	0	0	0	0	0	0
(b)	14	0	0	0	0	40	80	80
		80	80	20	20	80	160	320
(c)	20	0	0	0	0	80	160	80
		40	40	20	20	160	320	320
265 (a)	7	0	0	0	0	0	0	40
		40	40	0	40	40	0	160
(b)	14	-----	-----	-----	-----	320	320	160
		-----	-----	-----	-----	640	640	640
266 (a)	13	0	0	0	0	1,280	1,280	5,120
		40	0	40	20	5,120	5,120	10,240
(b)	23	0	0	0	0	1,280	640	2,560
		40	40	20	20	2,560	2,560	10,240
268 (a)	11	0	0	0	0	320	40	640
		40	40	20	0	640	160	2,560
(b)	20	0	0	0	0	160	160	160
		40	40	0	0	640	640	640
269 (a)	16	320	320	0	80	1,280	640	2,560
		1,280	1,280	0	320	10,240	2,560	10,240
(b)	31	320	-----	0	-----	-----	-----	640
		640	-----	0	-----	-----	-----	1,280
285 (a)	8	0	0	0	0	40	40	80
		80	80	40	40	160	160	160
(b)	14	0	0	0	0	1,280	1,280	1,280
		40	40	40	40	2,560	2,560	2,560
288(a)	8	0	0	0	0	0	40	0
		20	40	40	20	80	80	160
(b)	13	0	0	0	0	160	160	160
		40	40	0	0	320	320	640
297(a)	14	40	80	0	0	640	640	640
		160	320	80	80	1,280	1,280	2,560
(b)	24	0	0	0	0	640	1,280	1,280
		80	80	80	20	2,560	2,560	5,120
300(a)	15	0	0	0	0	80	80	80
		40	40	0	0	160	160	320
(b) [1]	20	0	0	0	0	320	160	160
		0	0	0	0	640	320	320
305(a)	10	0	0	0	0	0	0	0
		20	40	20	20	40	20	80
(b)	13	0	0	0	0	160	80	320
		20	20	0	40	320	320	640
(c)	18	0	0	0	0	320	320	320
		20	20	80	80	640	640	1,280
308(a)	5	0	0	0	0	0	0	0
		20	20	0	0	0	0	0
(b)	6	0	0	0	0	0	0	0
		40	40	0	0	0	0	40
311(a)	12	0	0	0	0	0	0	0
		40	40	40	80	20	80	40
(b)	14	0	0	0	0	0	0	0
		20	0	40	40	0	0	160
316(a)	11	0	0	0	0	320	320	640
		0	0	0	0	1,280	1,280	5,120
(b)	21	0	0	0	0	320	640	320
		0	20	0	0	1,280	1,280	1,280

See footnotes at end of table.

TABLE 2.—*The agglutination of proteus X strains by 2 or more sera from each of 24 cases of Rocky Mountain spotted fever*—Continued

Serum no.	Days after onset	Agglutinin titer for proteus X strains						
		OXK	HXK	OX_2	HX_2	OX_{19} (1) Z	OX_{19} (2) Z	OX_{19} (504)
327(a)	5	0	0	0	0	0	0	0
		0	20	0	0	40	20	80
(b)	14	0	0	0	0	40	40	80
		20	40	40	80	160	160	320
331(a)	10	0	0	0	0	160	0	80
		0	20	0	20	640	40	320
(b)	20	0	0	0	0	640	640	640
		20	40	20	40	1,280	1,280	2,560
332(a)	7	0	0	0	0	0	0	0
		0	0	0	0	40	20	80
(b)	17	0	0	0	0	0	40	80
		0	0	0	0	80	80	160
345(a)	6	0	0	0	0	0	0	40
		20	20	20	20	20	20	160
(b)	20	0	0	0	0	320	160	640
		0	0	0	0	1,280	320	1,280
375(a)	16	0	0	0	0	0	0	0
		40	20	20	20	0	20	40
(b)	27	0	----	0	----	0	----	0
		0	----	80	----	40	----	40
379(a)	4	0	----	0	----	0	----	0
		20	----	0	----	0	----	40
(b)	25	----	----	----	----	0	0	0
		----	----	----	----	40	80	160
383(a)	13	0	----	0	----	0	----	80
		20	----	20	----	160	----	320
(b)	28	----	----	----	----	80	80	80
		----	----	----	----	160	160	320

[1] Blood drawn 2 hours post mortem.
0=Negative in a final serum dilution of 1:20.
----=Not tested.
The upper figures represent the dilution of serum in which there was 100 percent agglutination, the lower give the highest serum dilution in which there was definite agglutination.

ANALYSIS OF AGGLUTINATION DATA (TABLES 1 AND 2)

The results of H-type agglutination have not been recorded in our tables; and since this type of agglutination is presumably of no diagnostic value (i.e., unless a "specific" strain of *proteus* should be isolated), no summarization of these data seems necessary. Strain X_{19} (1)Z, which was an O variant at the beginning of the work, later showed an O–HO reversion. This strain, therefore, has not been considered in the following analysis.

Of the two OX_{19} strains employed, (2)Z and 504, the latter is patently the more sensitive. Of the 96 sera with which these strains were used and with which agglutination occurred, both were agglutinated equally by 20 sera, but the latter (OX_{19} 504) was agglutinated in 1 dilution higher by 40 sera, in 2 dilutions higher by 18, in 3 dilutions higher by 7, in 4 dilutions higher by 3, in 5 dilutions higher by 3, and in 6 dilutions higher by 1. On the other hand, (2)Z was more sensitive to only 4 sera, 2 of which caused (2)Z agglutination by 1 dilution higher than it did 504, and 2 caused agglutination in 2 higher dilutions.

Using these results of OX_{19} (504) agglutinations as given in tables 1 and 2, the following data have been obtained that bear on the

relation of time of sample taking (after onset of symptoms) to the presence of OX_{19} agglutinins in diagnostic titer It is not felt that a set statement is justified as to what agglutinin titer is or is not of diagnostic value; but in the light of several years' experience, we believe that a 2+, 3+, or 4+ agglutination at a dilution of 1:160 is significant in the great majority of tests, and this is the criterion which has been used in analyzing our data

Of 27 samples taken during the first 9 days of illness, 10, or 37.03 percent, showed agglutination in sufficient titer to be of significance (6 at 1:160, 3 at 1:320, and 1 at 1:640). Of the remaining 17 samples, 2 were completely negative and 15 gave partial or complete agglutination in dilutions of from 1:20 to 1:80

Of 31 samples taken from the tenth to fifteenth days, inclusive, 26, or 83.87 percent, showed a significant agglutinin titer (4 in 1:160, 7 in 1:320, 5 in 1:640, 4 in 1:1,280, 4 in 1:2,560, 1 in 1:5,120, and 1 in 1:10,240). The remaining 5 showed partial or complete agglutination in 1:40 or 1:80.

Of 26 samples taken from the sixteenth to twenty-first days, inclusive, 21, or 80.77 percent, showed a significant titer (2 in 1:160, 4 in 1:320, 4 in 1:640, 6 in 1:1,280, 4 in 1:2,560, and 1 in 1:5,120). The other 5 caused complete or partial agglutination in 1:20, 1:40, or 1:80.

Of 16 samples taken from the twenty-second to thirty-second days, 13, or 81.25 percent, showed a significant titer (3 in 1:160, 4 in 1:320, 1 in 1:640, 3 in 1:2,560, 1 in 1:5,120, and 1 in 1:10,240). The remaining 3 were agglutinated partially or completely in 1:40 or 1:80.

Of 2 samples taken forty-five and forty-seven days after onset, respectively, the former caused agglutination in a dilution of 1:640 and the latter in 1:80.

Three samples taken in 1, 11, and 13 years after recovery showed only partial agglutination in 1·20 and 1:40.

In table 3 the above data are summarized to indicate the period after onset during which the blood samples of significant titer were taken.

TABLE 3.—*Period after onset during which blood samples (tables 1 and 2) of significant agglutinin titer were taken and the titer of each for strain OX_{19} (504)*

Period, days inclusive	Total samples tested	Number of sample having agglutinin titer of—								Percent significant
		1.80[1] or less	1 160	1 320	1.640	1 1,280	1 2,560	1 5,120	1.10,240	
1st to 9th	27	17	6	3	1					37.03
10th to 15th	31	5	4	7	5	4	4	1	1	83.87
16th to 21st	26	5	2	4	4	6	4	1		80.77
22d to 32d	16	3	3	4	1		3	1	1	81.25

[1] Not of significant titer.

Table 1 shows that, of 35 cases from which a single sample was taken at some time between the tenth and thirty-second days after onset, the agglutination test with strain 504 was significant for 27, i.e., for 77.14 percent On the other hand, table 2 shows that, when two or more samples were taken, one of which was secured either after the ninth day or during early convalescence, the test was positive in 21 of 22 cases, i e., for 95.45 percent In a number of these cases the diagnostic sample was taken during convalescence.

A further analysis of table 2 shows that there were 15 cases from which blood samples were taken both between the tenth and seventeenth days (during the period when a definite rise in agglutinins has appeared in most cases) and during convalescence. In this connection we are assuming that samples after the seventeenth day were taken post febrile, an assumption that would be true in a considerable proportion of cases, though we lack definite data for most of those here concerned. The data of these 15 cases show that the highest agglutinin titer was during illness in 4 cases (256, 257, 268, 316), during early convalescence in 7 (252, 254, 297, 300, 305, 331, 345), and the titer for the two periods was equal in 4 (259, 266, 375, 383). The convalescent sera were taken at various times from the eighteenth to the twenty-ninth day, and only 1 before the twentieth day. One case (254) is of particular interest in that a sample taken the nineteenth day was not significant, whereas one taken the twenty-ninth day was of diagnostic titer.

The use of the strain OXK gave the following results: Of 51 first- to thirty-second-day serum samples, only one (326) caused complete agglutination in any dilution This one serum caused 4+ agglutination in 1:160 and 2+ in 1:320. Of the other 50 samples, seventeen caused 2 + agglutination in 1:20; nine, 2+ in 1.40; seven, 2 + in 1:80; one, 2+ in 1:160, and sixteen were completely negative.

With regard to cases from which multiple samples were secured, we have these data: Only 2 cases (297 and 269) showed 4+ agglutination by any dilution; the former 4+ in 1:40, and 2+ in 1:160. The latter is of special interest. Sixteen days after onset, this serum completely agglutinated the OXK and HXK strains in a dilution of 1:320 and showed partial agglutination in a dilution of 1:1,280. It also agglutinated three X_{19} strains in a serum dilution of 1:10,240. Fifteen days following the first withdrawal of blood, a second large sample (approximately 400 cc, containing one-fifth part of 2 percent Na citrate) was obtained for experimental purposes. The agglutinin titer for OXK was only slightly changed, while the titer for OX_{19} (504) had dropped to 1:1,280. Had the original titer for OXK been "normal", i.e., unrelated to the infection, the dilution with Na citrate would have reduced it. It appears more reasonable to assume that

the agglutinins for OXK had not reached the maximum at the time the first blood specimen was taken and that the increase in the interim was sufficient to balance the reduction brought about by the diluent. This is in keeping with the findings of Felix (1933) with typhus sera, viz, that the minor agglutinins appear late. If the above assumption holds, it also appears that the minor agglutinins may remain at the maximum titer after the major agglutinins have diminished.

All other OXK tests gave incomplete agglutination in 1:20, 1:40, or 1:80. Of 3 cases from which 3 samples each were secured, one (6-, 14-, and 21-day samples) showed partial agglutination in 1:40 for the first and third samples and in 1:80 for the second. The second (7-, 14-, and 20-day samples) showed no agglutinins for the first sample, 2+ agglutination in 1:80 for the second, and 2+ in 1:40 for the last. The third gave 2+ agglutination in 1:20 for 10-, 13-, and 18-day samples. Of 16 two-sample cases, 7 showed a decreased titer in the second sample—1:80 to 1:40, 1:40 to 1:20, 1:40 to 0, and 1:20 to 0 (in this series the average day of the first sample was the thirteenth and the second the twenty-fourth); 6 showed an increased titer—0 to 1:20 and 1:20 to 1:40 (in this series the average day of the first sample was the eighth and the second the fourteenth); in 2 the titer remained constant, and in 3 it was negative for both of 2 samples.

As compared with these spotted fever sera data, 64 samples from "normal" individuals or from persons with infections not diagnosed as Rocky Mountain spotted fever gave the following titers for OXK: 27 were negative, while of the remaining 37, 2 were completely agglutinated in serum dilutions of 1:40 and partially agglutinated in 1:80 and 1:160, respectively. Partial reactions were shown by 15 in 1:20, 10 in 1:40, 7 in 1:80, and 2 in 1:160.

Strain OX_2 gave results as follows: Of 52 single samples, only one (335) causes 4+ agglutination in any dilution, 4+ in 1:80, and 2+ in 1:320. Of the other 51 samples, 16 caused 2+ agglutination in 1:20, 7 in 1:40, and 28 were negative.

Concerning cases from which multiple samples were secured, we have these data: Of 3 cases from which 3 samples each were secured, one showed an absence of agglutinins on the seventh day and 2+ agglutination in 1:20 on the fourteenth and twentieth days; the second showed absence on the sixth and fourteenth days and 2+ in 1:20 on the twenty-first day; and the third 1:20 on the tenth day, absence on the thirteenth, and 2+ in 1:80 on the eighteenth. Of 17 two-sample cases, 5 showed a decreased titer in the second sample—1:40 to 1:20, 1:40 to 0, or 20 to 0; 4 showed an increased titer—0 to 1:20, 0 to 1:40, or 1:20 to 1:80; 3 remained constant at 1:40 or 1:80; and 5 were negative in both samples, 3 of these being the same that gave a negative titer with OXK.

39908°—34——2

The 64 serum samples (from other than spotted fever cases) which were tested with OXK gave the following results with OX_2 There were no complete agglutinations, 37 were negative; and partial reactions were shown by 15 in 1:20, 11 in 1:40, and 1 in 1:80.

EXPERIMENTAL STUDIES

Test methods.—The agglutination test as made by our standard method with suspensions of living *proteus* X organisms (which, in our experience, has proved superior to formalinized material) requires at least 48 hours before a final report can be rendered to the physician. It has been deemed desirable to attempt to shorten this period, even though a prompt check on diagnosis is not essential from a public health standpoint nor of great value to the attending physician, since a significant result is seldom secured with blood samples taken before the tenth day. Accordingly, our standard method was checked with three others. Ten sera and 2 strains of OX_{19} ((1) Z and 504) were used. The results are given in table 4.

TABLE 4.—*The agglutination of proteus X strains by Rocky Mountain spotted fever sera—A comparative study of 4 methods*

Serum no	Proteus X strains	Standard method 37° C 2 hours, 8° C 48 hours				Water bath 55° C. 1 hour, 8° C 48 hours						Shaking 3 minutes 37° C 2 hours, 8° C 48 hours					Reagents concentrated, shaking 3 minutes 37° C 2 hours, 8° C 48 hours				
		Time of reading				Time of reading						Time of reading					Time of reading				
		1 hour	2 hours	24 hours	48 hours	10 minutes	20 minutes	30 minutes	1 hour	24 hours	48 hours	3 minutes	1 hour	2 hours	24 hours	48 hours	3 minutes	1 hour	2 hours	24 hours	48 hours
266	OX_{19}(1)Z	0 40	0 1,280	1,280 2,560	1,280 2,560	0 0	0 320	0 640	0 640	640 1,280	1,280 2,560	0 320	0 640	640 1,280	1,280 2,560	1,280 2,560	----	----	----	----	----
	OX_{19}(504)	0 160	0 640	640 2,560	1,280 2,560	0 40	0 320	0 320	0 640	320 1,280	640 1,280	0 320	0 640	320 640	640 2,560	1,280 5,120	----	----	----	----	----
275	OX_{19}(1)Z	0 160	0 320	320 1,280	320 1,280	0 0	0 160	0 160	0 160	80 160	160 640	0 40	0 320	0 320	320 640	320 1,280	0 160	40 160	40 640	80 1,280	160 1,280
	OX_{19}(504)	0 160	0 160	160 640	320 1,280	0 80	0 160	0 160	0 320	80 320	320 640	0 80	0 160	0 320	320 640	320 1,280	0 320	80 320	80 320	160 640	160 1,280
296	OX_{19}(1)Z	0 0	0 320	640 2,560	1,280 2,560	0 0	0 320	0 640	0 640	640 1,280	640 1,280	0 320	0 320	320 640	640 2,560	1,280 5,120	0 1,280	80 1,280	320 2,560	640 10,240	640 10,240
	OX_{19}(504)	0 0	0 640	640 1,280	1,280 2,560	0 0	0 320	0 320	0 640	640 1,280	320 1,280	0 320	0 640	320 640	640 2,560	1,280 2,560	0 1,280	160 1,280	640 5,120	640 5,120	1,280 10,240
303	OX_{19}(1)Z	0 0	0 640	640 1,280	1,280 2,560	0 0	0 160	0 320	0 320	320 640	640 1,280	0 160	0 320	320 640	640 1,280	1,280 2,560	----	----	----	----	----
	OX_{19}(504)	0 80	0 320	640 2,560	640 2,560	0 0	0 160	0 320	0 320	320 640	320 640	0 160	0 320	160 640	640 1,280	1,280 2,560	----	----	----	----	----
314	OX_{19}(1)Z	0 20	0 320	640 1,280	640 2,560	0 0	0 40	0 160	0 160	320 640	640 1,280	0 320	0 640	320 640	640 1,280	1,280 2,560	0 320	40 320	160 320	640 2,560	640 10,240
	OX_{19}(504)	0 80	0 320	640 1,280	640 1,280	0 0	0 0	0 80	0 80	0 640	320 640	0 160	0 320	320 640	640 1,280	640 2,560	0 320	160 640	320 1,280	640 2,560	640 5,120
316	OX_{19}(1)Z	0 160	0 320	640 1,280	640 1,280	0 0	0 160	0 160	0 160	160 640	160 1,280	0 160	80 320	160 320	640 1,280	640 1,280	0 320	20 320	80 640	320 1,280	320 10,240
	OX_{19}(504)	0 160	0 640	320 1,280	320 1,280	0 160	0 320	0 320	0 320	160 640	160 640	0 160	160 320	160 640	320 640	320 640	0 320	80 320	80 320	160 1,280	320 2,560

TABLE 4.—*The agglutination of proteus X strains by Rocky Mountain spotted fever sera—A comparative study of 4 methods*—Continued

Serum no.	Proteus X strains	Standard method 37° C. 2 hours, 8° C 48 hours				Water bath 55° C. 1 hour, 8° C 48 hours						Shaking 3 minutes 37° C 2 hours, 8° C 48 hours					Reagents concentrated, shaking 3 minutes 37° C 2 hours, 8° C 48 hours				
		Time of reading				Time of reading						Time of reading					Time of reading				
		1 hour	2 hours	24 hours	48 hours	10 minutes	20 minutes	30 minutes	1 hour	24 hours	48 hours	3 minutes	1 hour	2 hours	24 hours	48 hours	3 minutes	1 hour	2 hours	24 hours	48 hours
322	OX_{19}(1)Z	0 640	0 640	640 2,560	1,280 2,560	0 160	0 320	0 320	0 640	320 640	640 1,280	0 0	0 1,280	0 1,280	1,280 2,560	1,280 2,560	0 320	80 640	160 1,280	640 5,120	640 5,120
	OX_{19}(504)	0 640	0 640	640 2,560	1,280 2,560	0 320	0 640	0 1,280	0 1,280	320 1,280	640 1,280	0 160	0 640	0 640	640 2,560	1,280 2,560	0 320	80 640	160 1,280	640 2,560	640 5,120
326	OX_{19}(1)Z	0 640	160 1,280	1,280 2,560	1,280 2,560	0 0	0 160	0 320	0 640	160 640	640 2,560	0 640	320 1,280	640 1,280	640 2,560	1,280 5,120	0 640	80 2,560	80 2,560	1,280 5,120	1,280 5,120
	OX_{19}(504)	0 640	320 1,280	1,280 2,560	1,280 5,120	0 320	0 640	0 640	0 1,280	160 1,280	640 2,560	0 320	320 1,280	320 1,280	640 2,560	1,280 5 120	0 640	160 2 560	640 2 560	1,280 5 120	1,280 5,120
335	OX_{19}(1)Z	0 1,280	0 2,560	1,280 2,560	2,560 5,120	0 640	0 1,280	0 1,280	0 1,280	640 2,560	1,280 5,120	0 1,280	0 2,560	0 2,560	1,280 5,120	1,280 5,120	0 1,280	320 2,560	640 2,560	1,280 5,120	1,280 5,120
	OX_{19}(504)	0 1,280	0 2,560	1,280 5,120	2,560 10,240	0 1,280	0 1,280	0 1,280	0 1,280	640 2,560	1,280 5,120	0 1,280	0 2,560	0 2,560	1,280 5,120	1,280 5,120	0 1,280	640 2,560	1,280 2,560	1,280 2,560	2,560 5,120
341	OX_{19}(1)Z	0 160	0 320	320 1,280	640 1,280	0 20	0 80	0 160	0 160	160 320	320 1,280	0 160	0 320	0 320	320 640	320 1,280	0 640	0 640	80 640	160 1,280	160 2,560
	OX_{19}(504)	0 160	0 160	320 640	640 1,280	0 80	0 160	0 320	0 320	160 320	320 1,280	0 80	0 320	0 320	320 640	320 1,280	0 320	80 320	160 320	320 1,280	320 2,560

0=Negative in a final serum dilution of 1 20
----=Not tested
The upper figures represent the dilution of serum in which there was 100 percent agglutination, the lower give the highest serum dilution in which there was definite agglutination.

1. Our standard method consists of adding 0.5 cc of a 500 parts per million (silica standard) suspension of living organism to 0 5 cc of the several serum dilutions, then incubating at 37° C. for 2 hours and finally placing in the electric refrigerator for approximately 48 hours. In this study, readings were recorded at 1, 2, 24, and 48 hours These tests were the controls

2. In the second method the bacterial suspensions and sera were mixed as in the standard method and placed in the water bath at 55° C. with the mixtures half submerged. By this method, convection currents keep the organisms in slow movement Readings were made at 10-, 20-, 30-, and 60-minute intervals and as usual following refrigeration.

3. The third method consisted of adding the bacterial suspension to the diluted sera, followed immediately by rapid shaking by hand for 2 minutes and slow shaking for 1 minute, after which time the first reading was made. Additional readings were made following incubation and refrigeration as for controls

4. The bacterial suspensions and serum dilutions were used in five times the concentration of the standard method. Following rapid shaking for 3 minutes, the volume of each tube was made up to the total of 1 cc with saline and read immediately. Additional readings were made after 1 and 2 hours at 37° C. and after 24 and 48 hours' refrigeration.

Results—Although 55° C. appeared to accelerate the reaction with certain sera, the final titers were, as a whole, lower than by any of the other methods This result was to be expected in the light of what is known concerning the thermolability of O agglutinins

Following shaking for 3 minutes, 7 of the 10 sera showed as high a titer as, or higher than, the 1-hour reading by the standard method. Following subsequent 1-hour incubation at 37° C., all the shaken sera showed as high or a higher titer. After 2 hours' incubation, 6 sera showed a 100 percent agglutination in 4 or more serum dilutions, while in the control test (standard method) only 1 of these same sera showed 100 percent agglutination in any dilution at the same reading.

In the majority of the tests with the concentration method the readings at the end of the 3-minute shaking period were as high as, or higher than, at the end of the first-hour period by the standard method. At the end of the first-hour period the concentration method showed 100 percent agglutination in 2 or more tubes in all sera tested, while there was one by the standard method. The reaction is definitely accelerated by this method and with all sera but 2 the final titers were increased with one or both of the test antigens.

The final readings were relatively comparable by all methods except the second.

Thermolability of agglutinins.—Studies on the thermolability of agglutinins were continued Forty-three sera were tested after heating at 55° C. and 62° C for a half hour. As a rule there was a definite reduction in agglutinin titer following heating at 55° C. and a much more marked reduction following heating at 62° C In certain instances the latter treatment reduced the agglutinin titer to nil This is in complete agreement with studies on typhus sera.

Formalinized suspensions —In our former report we made the statement, based on the theory that formalin affects neither the O agglutinogen nor the O agglutinin, that formalinized suspensions would have the same practical advantage as alcoholized suspensions when working with O strains. However, of 22 sera tested with formalinized suspensions of OX_{19} (504) and OX_{19} (2)Z, 17, or approximately 77 percent, showed a lower titer with the former (3 were equal and 2 were slightly higher), while all the sera showed a definitely lower titer with the latter The suspensions had been preserved with 0.2 to 0 3 percent formalin and diluted 1.15 or 1.20 when used. We have not yet employed the longer incubation period at higher temperatures as used by Gardner and Stubington (1932) and recently recommended by Felix (*loc. cit.*).

DISCUSSION AND CONCLUSIONS

The main value of the results of this series of agglutination tests is the information which they furnish concerning the number of samples which should be tested from a given case and the period after onset when the samples should be taken.

In our previous paper it was suggested that at least 2 samples should be taken, 1 between the tenth and fifteenth days, the other a week or 10 days later. In the light of our further experience it is now felt that there should be three samples, the first taken early in the course of the disease or as soon as spotted fever is suspected, the second during the period from the tenth day to cessation of fever, and the third about the end of the first week of convalescence. Though it is evident from the tables that only a relatively small percentage of sera taken during the first 9 days are of diagnostic significance, the results, nevertheless, are of great value for subsequent comparison with the titer of the later samples in order to determine whether a definite rise in agglutinin content has occurred. This is particularly important in the type of case (of rather frequent occurrence) in which the high point of the agglutinin titer is too low to be of significance unless such a rise can be shown, and also in such cases as give an unexpected high titer with one or more of the test antigens early in the disease. There are other cases in which a consequential rise in

titer does not take place until during early convalescence, and in some cases the highest titer is present during this period. Hence, the desirability of the third sample, although this could be dispensed with in many instances in a locality where laboratories are close at hand

When using H variants of *proteus* X_{19} there were marked differences in titers obtained with the several strains Certain H variants were agglutinated only in very low titer, although all of our strains have been treated in a similar manner for approximately the same period of time. There were also slight differences in the agglutinability of O variants. However, the O variant of any individual strain appears to retain the same degree of sensitiveness over a long period

Although OXK and OX_2 strains are more frequently agglutinated by spotted fever sera than by "normal" sera, the resultant titers, in the present series of tests, are, with a few exceptions, so low as to be of no importance in diagnosis. However, since our comparative studies of Rocky Mountain spotted fever and Sao Paulo typhus have shown identical serologic and immunologic reactions except with respect to OXK and OX_2 agglutinins, it is felt that a further study of these agglutinins in relation to these two diseases is desirable. Especially is this true in view of the fact that the OXK and OX_2 types are of apparent value in the study of the relationships of typhus-like diseases.

Heating sera at 55° C. for one-half hour definitely reduce the agglutinating properties, while heating at 62° C. for the same period completely destroyed the agglutinins in certain of the sera tested.

With the technique which we have used, fresh, unpreserved suspensions are definitely superior to formalinized suspensions as test antigens.

The use of concentrated reagents for the presumptive test may be of value.

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COURT DECISION ON PUBLIC HEALTH

City held without power to enact health ordinance after creation of county health department.—(Mississippi Supreme Court, Division B; *City of Jackson* v. *Ferguson et al*., 150 So. 531; decided Oct. 30, 1933.) Pursuant to statutory authority Hinds County created and put into operation a department of health. The city of Jackson, located within the county, passed an ordinance, after the county health department had been established, creating the office of food inspector and regulating the inspection of milk and milk products. Certain milk producers sought an injunction against the city to prohibit the enforcement of the ordinance as to them and all others similarly situated. The lower court granted the injunction prayed for and the city appealed to the supreme court.

The appellees relied upon the following portion of section 4926 of the Code of 1930:

> * * * When any county or counties create a health department hereunder, then all other local or municipal or county public-health agencies and departments are thereby automatically abolished and said county and district health department shall have full control over all health matters in said county and counties, including all municipalities therein, but subject to the supervision, direction, and jurisdiction of the State board of health. *Provided, however*, That the proper authorities of any municipality in the State of Mississippi are hereby authorized in their discretion to make an appropriation for the support of such county or district health department from the general funds of such municipality.

The city's contention was that section 4926 should be considered as in pari materia with the several general statutes giving power to municipalities to enact ordinances and to prescribe regulations for the preservation of the health of the inhabitants thereof. It was argued that, when the section was so considered, the city was vested with concurrent jurisdiction in such matters where the county had established a health department. The supreme court, however, did not accept this view but affirmed the decree of the lower court, saying:

> * * * It will be noted, however, that the quoted sentence taken from section 4926 is a particular provision applicable to particular situations, and, under familiar rules, controls over general statutes governing general situations. The quoted language is expressly, and in plain terms, that, when a county has created a health department, the action of the county shall have the effect automatically to abolish all other local or municipal health agencies within that county. We cannot grasp the conception that a particular municipal agency can have any jurisdiction, or power, or existence, concurrent or otherwise, when it has been or is abolished. The contention of the city, if sustained, would not be to read section 4926 as in pari materia with the other general statutes mentioned, but would be to repeal that particular section in part by judicial construction, and, this accomplished, to allow the other general statutes to come into effect in contravention of the plain and mandatory words of the particular statute thus partially repeated [repealed?]. This, of course, the courts are without the authority to do.

DEATHS DURING WEEK ENDED FEBRUARY 10, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Feb 10, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	8,792	8,465
Deaths per 1,000 population, annual basis	12 2	11 8
Deaths under 1 year of age	569	593
Deaths under 1 year of age per 1,000 estimated live births	53	[1] 51
Deaths per 1,000 population, annual basis, first 6 weeks of year	12 5	12 7
Data from industrial insurance companies		
Policies in force	67,489,817	69,070,242
Number of death claims	13,811	15,399
Death claims per 1,000 policies in force, annual rate	10 7	11 6
Death claims per 1,000 policies, first 6 weeks of year, annual rate	11 0	11 8

[1] Data for 81 cities

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended February 17, 1934, and February 18, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb. 17, 1934, and Feb 18, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb 17, 1934	Week ended Feb 18, 1933
New England States.								
Maine	2	1	8	56	4	3	0	1
New Hampshire		1		8	174	1	0	0
Vermont	1	2			45	4	0	0
Massachusetts	7	22		19	2,386	265	3	0
Rhode Island	3	5		4	2	3	0	0
Connecticut	3	3	8	38	39	159	0	0
Middle Atlantic States								
New York	47	67	[1] 23	[1] 41	804	1,993	4	4
New Jersey	20	22	24	91	382	818	1	2
Pennsylvania	45	99			1,056	866	3	10
East North Central States:								
Ohio	42	59	131	208	436	455	2	2
Indiana	29	37	57	55	450	25	0	3
Illinois	38	46	40	72	512	270	6	14
Michigan	15	21	3	6	44	820	2	1
Wisconsin	10	3	98	227	1,164	286	2	0
West North Central States.								
Minnesota	9	2	3	1	229	1,387	1	1
Iowa [2]	7	16	13		78	3	2	2
Missouri	59	30	288	25	1,778	37	3	2
North Dakota	7	5		228	46	80	1	0
South Dakota	1	9		1	159	21	1	1
Nebraska	4	14	22	1	109	28	0	1
Kansas	27	6	10	13	121	331	3	0
South Atlantic States								
Delaware	2	12	2	5	143	2	0	0
Maryland [2, 3]	8	14	45	117	842	4	0	2
District of Columbia	5	10	5	3	413	5	0	0
Virginia	25	18			725	444	1	1
West Virginia	18	18	33	271	18	552	0	0
North Carolina [3]	25	15	75	332	3,040	555	2	3
South Carolina	7	8	841	1,824	496	56	0	0
Georgia [3]	24	11	229	491	1,515	14	0	1
Florida	2	3	2	61	123	10	0	1

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb 17, 1934, and Feb. 18, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb 17, 1934	Week ended Feb 18, 1933
East South Central States								
Kentucky	25	10	67	118	265		1	1
Tennessee	16	15	183	168	904	52	1	3
Alabama [3]	16	13	186	192	525	13	1	1
Mississippi [2]	8	1					0	1
West South Central States								
Arkansas	4	5	67	113	765	4	2	1
Louisiana	16	16	11	51	113	27	1	2
Oklahoma [4]	15	16	121	228	449	20	6	5
Texas [3]	197	54	1,076	252	1,816	679	3	1
Mountain States								
Montana [5]	2		49	93	16	154	0	0
Idaho		3		1	19	90	0	0
Wyoming				2	56	10	0	1
Colorado	7	6		68	63	3	0	1
New Mexico	3	7	9	11	105	4	0	0
Arizona	6	2	15	12	24		2	1
Utah [2]		3			815	3	0	1
Pacific States:								
Washington	6	8	3	1	268	6	0	1
Oregon	4	1	49	94	49	111	0	0
California	50	52	39	129	1,340	449	3	3
Total	862	791	3,825	5,731	24,425	11,122	57	75

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb. 17, 1934	Week ended Feb 18, 1933
New England States								
Maine	0	0	24	20	0	0	3	1
New Hampshire	0	0	33	44	0	0	0	0
Vermont	0	0	17	12	0	0	1	0
Massachusetts	0	1	251	390	0	0	3	3
Rhode Island	0	0	12	40	0	0	0	0
Connecticut	0	0	50	97	0	1	0	0
Middle Atlantic States								
New York	1	1	694	738	0	0	4	5
New Jersey	1	0	221	314	0	0	4	1
Pennsylvania	2	0	740	856	0	0	13	10
East North Central States								
Ohio	0	0	753	746	0	6	8	2
Indiana	0	2	291	133	1	1	6	1
Illinois	1	0	621	435	5	11	2	6
Michigan	1	1	517	528	4	0	3	6
Wisconsin	0	0	231	98	33	3	4	1
West North Central States								
Minnesota	0	0	59	77	2	1	0	3
Iowa [2]	0	0	78	31	8	25	1	0
Missouri	1	0	212	50	7	1	10	2
North Dakota	0	0	31	11	1	0	0	0
South Dakota	0	0	18	21	1	2	1	2
Nebraska	0	0	23	24	6	1	2	0
Kansas	0	0	115	78	4	2	2	1
South Atlantic States:								
Delaware	0	0	10	5	0	0	0	0
Maryland [2 3]	0	0	87	81	0	0	4	1
District of Columbia	1	0	14	11	0	0	0	0
Virginia	0	0	74	36	0	0	5	3
West Virginia	1	0	84	25	0	0	2	7
North Carolina [3]	1	0	51	29	0	0	2	3
South Carolina	0	0	10	2	0	0	6	3
Georgia [3]	0	0	0	9	0	0	5	9
Florida	0	0	1	7	0	0	2	6

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb 17, 1934, and Feb 18, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb 17, 1934	Week ended Feb 18, 1933	Week ended Feb 17, 1934	Week ended Feb 18, 1933
East South Central States								
Kentucky	0	2	79	30	1	0	2	6
Tennessee	0	1	64	30	0	1	2	4
Alabama [3]	1	0	20	21	2	3	2	0
Mississippi [2]	0	0	11	8	0	4	1	2
West South Central States								
Arkansas	0	0	10	4	22	3	2	3
Louisiana	0	0	26	2	7	2	11	6
Oklahoma [4]	0	1	27	24	8	4	5	1
Texas [3]	0	0	179	55	53	8	39	14
Mountain States								
Montana [5]	0	0	12	31	0	2	0	0
Idaho	0	0	10	3	1	5	0	0
Wyoming	0	0	6	11	1	0	0	0
Colorado	0	0	56	25	14	0	0	1
New Mexico	0	0	34	12	0	0	2	0
Arizona	0	0	22	14	0	0	0	3
Utah [2]	0	0	10	9	2	0	0	0
Pacific States								
Washington	0	0	45	39	3	5	1	3
Oregon	0	0	38	30	1	6	1	1
California	3	1	247	208	4	33	5	4
Total	14	10	6,218	5,504	186	130	166	124

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended Feb 17, 1934, 29 cases, as follows Maryland, 1, North Carolina, 1, Georgia, 5 Alabama, 15, Texas, 7
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended Feb 17, 1934, Montana, 1 case

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1934										
Indiana	10	193	332		1,432		1	1,000	14	6
Iowa	4	54	51		219		0	388	25	5
Massachusetts	6	74		5	6,069		2	1,028	0	5
Michigan	3	65	14	4	174		6	1,738	1	10
Minnesota	1	61	5		513		5	287	12	15
New Jersey	5	99	121		771		2	814	0	22
New Mexico	1	39	16	2	477	1	1	208	1	26
New York	9	269		10	2,737		6	2,981	0	25

January 1934

	Cases
Anthrax	
Massachusetts	1
New York	1
Chicken pox:	
Indiana	907
Iowa	498
Massachusetts	1,649
Michigan	1,599
Minnesota	887
New Jersey	2,141
New Mexico	115
New York	3,982
Conjunctivitis:	
Iowa	1
New Mexico	3
Dysentery	
Iowa	1
Massachusetts (amoebic)	1
Massachusetts (bacillary)	1
Michigan	9
Minnesota (amoebic)	19
Minnesota (bacillary)	22
New Jersey	10
New Mexico	2
New York (amoebic)	21
New York (bacillary)	14
Food poisoning:	
New Mexico	4
German measles	
Iowa	109
Massachusetts	47
Michigan	54
New Jersey	25
New Mexico	3
New York	81
Impetigo contagiosa	
Iowa	4
Lethargic encephalitis	
Iowa	2
Massachusetts	7
Michigan	8
New Jersey	2
New York	9

	Cases
Milk sickness	
New Mexico	7
Mumps	
Indiana	131
Iowa	208
Massachusetts	651
Michigan	612
New Jersey	304
New Mexico	36
Ophthalmia neonatorum	
Massachusetts	123
New Jersey	3
New Mexico	1
New York	3
Paratyphoid fever	
Minnesota	1
New York	1
Psittacosis	
New York	1
Puerperal septicemia	
New Mexico	2
Rabies in animals	
Indiana	29
Massachusetts	9

Rabies in animals—Con	Cases
New Jersey	19
New York	[1] 2
Septic sore throat	
Massachusetts	16
Michigan	91
New York	28
Tetanus	
Massachusetts	2
Michigan	1
New Jersey	1
New York	5
Trachoma	
Massachusetts	12
Minnesota	3
Trichinosis	
Iowa	1
Massachusetts	1
New Jersey	3
New York	23
Tularaemia	
Iowa	1
Michigan	1
Minnesota	3

Tularaemia—Con	Cases
New Jersey	1
New York	2
Undulant fever	
Iowa	7
Massachusetts	1
Michigan	6
Minnesota	10
New Jersey	1
New York	25
Vincent's infection	
Iowa	7
Michigan	19
New York	[1] 137
Whooping cough	
Indiana	182
Iowa	148
Massachusetts	1,759
Michigan	895
Minnesota	216
New Jersey	752
New Mexico	83
New York	1,893

[1] Exclusive of New York City

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb 10, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	7	2	0	0	0	7	23
New Hampshire											
Concord	0	------	1	20	1	1	0	1	0	1	12
Nashua	0	------	0	0	0	2	0	0	0	0	------
Vermont											
Barre	0	0	0	0	0	0	0	0	0	0	4
Burlington	0	------	0	0	0	3	0	0	0	4	17
Massachusetts											
Boston	0	------	1	299	38	52	0	15	0	46	252
Fall River	1	------	1	0	3	2	0	0	0	9	35
Springfield	0	------	0	1	1	8	0	0	0	20	36
Worcester	0	------	1	60	4	10	0	5	0	9	45
Rhode Island											
Pawtucket	0	------	0	0	0	0	0	0	0	0	24
Providence	1	------	0	1	10	9	0	2	0	21	70
Connecticut											
Bridgeport	1	1	0	1	4	13	0	2	0	0	35
Hartford	8	------	1	2	7	14	0	0	0	1	26
New Haven	0	------	1	0	3	5	0	2	0	2	47
New York											
Buffalo	0	------	1	281	6	23	0	7	0	20	140
New York	25	30	13	19	159	270	0	94	4	88	1,550
Rochester	0	------	0	0	5	27	0	1	0	3	73
Syracuse	0	------	0	1	6	3	0	3	0	36	52
New Jersey											
Camden	1	1	0	28	6	3	0	1	0	1	------
Newark	0	4	0	3	13	14	0	8	3	25	104
Trenton	0	1	0	10	7	14	0	1	0	11	47
Pennsylvania											
Philadelphia	7	8	2	917	58	90	0	29	1	36	535
Pittsburgh	4	5	3	35	30	82	0	7	0	29	178
Reading	1	------	0	6	2	2	0	2	0	11	38
Scranton	1	------	0	1	0	7	0	0	0	4	------
Ohio											
Cincinnati	9	1	2	292	8	27	0	6	0	13	142
Cleveland	1	45	2	17	26	101	0	14	0	78	201
Columbus	3	1	1	4	8	40	0	4	0	11	85
Toledo	0	1	0	72	4	56	0	3	0	46	72
Indiana											
Fort Wayne	6	------	0	0	4	20	0	0	0	0	22
Indianapolis	1	------	0	161	16	12	0	2	0	32	------
South Bend	0	------	0	0	2	4	0	1	0	8	16
Terre Haute	0	------	0	38	2	0	0	0	0	0	26

City reports for week ended Feb. 10, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Illinois:											
Chicago	7	5	9	54	76	252	0	38	1	173	747
Springfield	1	1	0	11	4	4	0	1	0	0	29
Michigan:											
Detroit	9	3	5	6	26	121	0	10	0	118	278
Flint	0	------	0	10	7	86	0	3	0	15	33
Grand Rapids	0	------	0	1	2	16	0	0	0	2	24
Wisconsin:											
Kenosha	0	------	0	0	0	23	1	0	0	0	9
Madison	[1] 1	------	------	1	------	4	0	------	0	22	10
Milwaukee	2	------	0	5	3	59	0	3	0	114	94
Racine	0	------	0	3	0	11	1	0	0	2	8
Superior	0	------	2	0	1	0	0	0	0	0	11
Minnesota:											
Duluth	0	------	0	0	3	0	0	0	1	0	23
Minneapolis	1	------	0	5	11	31	0	2	0	23	119
St. Paul	0	------	0	0	11	6	0	3	1	8	83
Iowa:											
Des Moines	5	------	------	4	------	20	0	------	0	0	31
Sioux City	0	------	------	2	------	0	0	------	0	1	------
Waterloo	0	------	------	0	------	0	0	------	0	1	------
Missouri:											
Kansas City	3	2	0	4	12	26	0	1	0	6	114
St. Joseph	1	------	1	5	0	2	0	2	0	0	25
St. Louis	22	------	1	698	10	38	0	10	1	51	217
North Dakota:											
Fargo	0	------	2	88	0	0	0	0	0	6	5
Grand Forks	0	------	0	1	0	0	0	0	0	3	------
South Dakota:											
Aberdeen	0	------	0	0	0	0	0	0	0	0	0
Nebraska:											
Omaha	0	------	2	82	7	3	1	0	0	7	58
Kansas:											
Topeka	0	------	0	1	4	0	0	0	0	2	9
Wichita	2	------	0	2	3	8	0	1	0	1	23
Delaware:											
Wilmington	1	------	0	28	2	1	0	4	0	2	32
Maryland:											
Baltimore	3	10	3	126	32	26	0	12	0	163	228
Cumberland	1	------	0	0	1	2	0	0	0	2	15
Frederick	0	------	0	0	0	3	0	0	0	0	4
District of Columbia:											
Washington	6	4	3	324	20	19	0	10	0	16	156
Virginia:											
Lynchburg	2	------	0	1	2	2	0	0	0	5	10
Richmond	1	2	2	4	5	7	0	4	0	3	63
Roanoke	1	------	1	0	6	3	0	1	0	0	21
West Virginia:											
Charleston	0	1	0	0	2	0	0	1	0	0	14
Huntington	1	------	0	0	0	12	0	0	0	0	------
Wheeling	0	------	0	0	0	5	0	1	0	7	10
North Carolina:											
Raleigh	1	------	0	4	2	3	0	0	0	15	13
Wilmington	1	------	0	0	2	0	0	1	0	0	12
Winston-Salem	0	------	1	233	3	5	0	1	0	0	15
South Carolina:											
Charleston	0	30	2	------	3	2	0	1	2	3	29
Columbia	0	------	0	0	0	0	0	0	0	0	5
Greenville	0	------	0	1	0	1	0	1	0	4	14
Georgia:											
Atlanta	4	17	2	76	17	5	0	0	1	4	102
Brunswick	0	------	0	82	1	0	0	0	0	0	2
Savannah	0	60	0	85	1	0	0	2	0	0	33
Florida:											
Miami	0	1	0	3	0	2	0	3	0	1	29
Tampa	3	1	1	1	0	0	0	0	0	0	19
Kentucky:											
Ashland	0	------	------	0	------	0	0	------	0	0	------
Lexington	0	------	0	0	4	2	0	2	1	0	16
Louisville	11	2	0	1	9	33	0	1	0	19	71

[1] Nonresident.

City reports for week ended Feb. 10, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Tennessee											
Memphis	2	------	1	183	11	15	0	6	0	8	97
Nashville	0	------	1	128	6	0	4	1	0	7	47
Alabama											
Birmingham	7	2	6	11	11	6	0	7	0	1	80
Mobile	1	------	0	2	3	2	0	3	0	0	32
Montgomery	0	------	------	6	------	1	0	------	0	1	------
Arkansas											
Fort Smith	0	------	0	48	------	1	0	------	0	2	------
Little Rock	0	------	0	115	2	1	0	1	0	0	3
Louisiana											
New Orleans	20	10	7	24	18	14	0	11	0	0	188
Shreveport	1	------	0	2	4	2	0	1	0	5	36
Oklahoma											
Tulsa	0	------	------	43	------	0	0	------	0	1	------
Texas											
Dalles	13	2	2	0	8	7	1	2	0	3	63
Fort Worth	5	------	0	0	5	8	0	0	1	3	33
Galveston	0	------	0	0	3	3	0	0	1	0	17
Houston	6	------	1	1	9	4	0	2	2	0	59
San Antonio	2	------	5	4	6	15	0	2	1	0	58
Montana											
Billings	0	------	0	0	0	0	0	0	0	0	5
Great Falls	0	------	0	0	0	0	0	0	0	5	8
Helena	0	------	0	1	0	0	0	0	0	0	6
Missoula	0	------	0	0	0	0	0	0	0	0	4
Idaho											
Boise	0	------	0	0	1	0	0	1	0	2	6
Colorado											
Denver	2	29	1	5	8	13	1	3	0	63	65
Pueblo	0	------	0	1	2	4	0	0	0	4	10
New Mexico											
Albuquerque	1	------	0	0	2	1	0	7	0	3	11
Utah											
Salt Lake City	0	------	2	589	0	7	0	1	0	15	26
Nevada											
Reno	0	------	0	0	0	0	0	0	0	0	3
Washington											
Spokane	0	------	------	208	------	1	5	------	0	7	30
Tacoma	0	------	0	17	3	0	0	0	0	17	23
Oregon											
Portland	0	------	1	4	6	14	2	2	0	10	81
Salem	0	3	0	0	0	0	0	0	0	11	------
California											
Los Angeles	25	19	0	38	23	69	1	20	2	68	324
Sacramento	0	------	0	0	1	2	0	1	0	0	28
San Francisco	0	2	1	25	9	14	0	6	3	16	149

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
New York				Iowa			
New York	4	2	1	Des Moines	1	0	0
Rochester	0	0	1	Missouri			
New Jersey				Kansas City	1	1	0
Newark	1	0	0	Kansas			
Pennsylvania				Topeka	0	1	0
Reading	1	0	0	District of Columbia			
Ohio				Washington	1	0	0
Cleveland	0	1	0	Colorado			
Indiana				Denver	1	0	1
Indianapolis	1	0	1	California			
Illinois				Los Angeles	1	0	0
Chicago	5	1	0	San Francisco	0	0	1
Michigan							
Detroit	1	0	0				

Pellagra —Cases Philadelphia, 2, Washington, 1; Lynchburg, 1, Charleston, S C, 3, Savannah, 3, Tampa, 1; Dallas, 1, San Francisco, 1

Lethargic encephalitis —Cases Cleveland, 1, St Joseph, 1, St. Louis, 1, Atlanta, 1, Louisville, 1, Birmingham, 1, San Francisco, 1

Typhus fever —Cases. Savannah, 2; Montgomery, 2, New Orleans, 1.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—Two weeks ended February 10, 1934.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended February 10, 1934, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Measles	224
Chicken pox	224	Puerperal septicemia	1
Diphtheria	28	Scarlet fever	121
Dysentery	1	Tuberculosis	139
Erysipelas	8	Typhoid fever	40
German measles	6	Undulant fever	1
Influenza	1	Whooping cough	312

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Feb 23, 1934, pp 276–288 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Mar 30, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands.—During the week ended February 17, 1934, cholera was reported in the Philippine Islands as follows: Bohol Province—Balilihan, 4 cases, 2 deaths; Calape, 7 cases, 6 deaths; Clarin, 22 cases, 14 deaths; Corella, 1 case, 1 death; Cortes, 4 cases, 3 deaths; Inabanga, 5 cases, 3 deaths; Loon, 7 cases, 3 deaths; Tagbilaran, 3 cases; Talibon, 3 cases, 2 deaths; Tubigon, 10 cases, [illegible] deaths. Occidental Negros Province—Calatraba, 2 cases, 4 deaths; Oroquieta, 1 case, 1 death; San Carlos, 2 cases, 1 death. Oriental Negros Province—Ayuquitan, 8 cases, 6 deaths; Bais, 3 cases, 2 deaths; Tanjay, 16 cases, 11 deaths.

Smallpox

China—Manchuria.—A report dated February 10, 1934, states that an epidemic of smallpox had occurred in Mukden, Manchuria. One hundred and forty cases with 17 deaths had been reported in the railway concession from January 1 to February 9, 1934.

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 10

MARCH 9 - - - - - 1934

IN THIS ISSUE

The Frequency of Health Examinations in 9,000 Families
Deaths in Large Cities During the Week Ended February 17
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution

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CONTENTS

Page

Frequency of health examinations in 9,000 families, based on nation-wide periodic canvasses, 1928–1931 321

Court decision on public health 346

Deaths during week ended February 17, 1934.

Deaths and death rates for a group of large cities in the United States 347

Death claims reported by insurance companies 347

PREVALENCE OF DISEASE

United States

Current weekly State reports:

Reports for weeks ended February 24, 1934, and February 25, 1933 348

Summary of monthly reports from States 350

Epidemic of cerebrospinal meningitis in the Arkansas State Penitentiary 351

Weekly reports from cities

City reports for week ended February 17, 1934 352

Foreign and insular

Canada:

Provinces—Communicable diseases—2 weeks ended February 10, 1934 355

Ontario Province—Communicable diseases—4 weeks ended January 27, 1934 355

Cholera, plague, smallpox, typhus fever, and yellow fever:

Cholera 356

PUBLIC HEALTH REPORTS

VOL. 49 MARCH 9, 1934 NO. 10

FREQUENCY OF HEALTH EXAMINATIONS IN 9,000 FAMILIES, BASED ON NATION-WIDE PERIODIC CANVASSES, 1928-1931 *

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CONTENTS

	Page
Source and character of the data	322
Total medical care	322
Frequency of examinations—	
Of different types	323
At different ages	326
Among males and females	327
Among married and single persons	329
In different income levels	329
In different occupations	331
Frequency of examinations—Continued	
In urban and rural areas	332
Among those sick and those not sick	333
Examinations in public clinics and private practice	336
Character of the examinations	340
Summary	344
References	345

Health examinations have been widely advocated in recent years as a means of early diagnosis of incipient pathological conditions. Early attention to minor diversions from the normal may be a means of preventing the development of serious disease. The Bulletin of the Chicago Tuberculosis Sanitarium (2) says: "The correction of defects, periodic examinations, and general health survey are immensely important in the care of children exposed to tuberculosis." In a discussion of the care of cancer patients, Quick (13) says. "Routine health examinations, carefully and seriously done, will contribute greatly toward early diagnosis of many malignant growths"

Many reports have been made on the number and kind of defects found on physical examination of school children (4, 9, 10), and a few similar studies cover adults (1, 6, 15); but data are lacking on the proportion of persons, particularly of adults, who have an examination in the course of a year.

* From the Office of Statistical Investigations, U S Public Health Service This is the second of a series of papers on sickness and medical care in this group of families (5) The survey of these families was organized as the basic investigation of the Committee on the Costs of Medical Care After the records had been accumulated by the committee, a cooperative arrangement between the committee and the Public Health Service was made and the data were tabulated under the joint supervision of the Office of Statistical Investigations and members of the research staff of the committee Committee publications based on the results are to deal primarily with costs and Public Health Service publications primarily with the incidence of illness and the extent and kind of medical care, without regard to cost As costs are meaningless without the extent and nature of the service received, there will inevitably be some overlapping

Grateful acknowledgment is made for advice and assistance received in the course of the study from various members of the research staff of the Committee on the Costs of Medical Care, particularly Dr I S. Falk and Miss Margaret C. Klem, and from members of the statistical staff of the Public Health Service Special thanks are due to Miss Lily Vanzee, who was in immediate charge of tabulating the data.

SOURCE AND CHARACTER OF DATA

In connection with the study of illness in canvassed families in 130 localities in 18 States that was made by the Committee on the Costs of Medical Care and the United States Public Health Service (5, 7), all service received from physicians or other practitioners was recorded, whether for illness, physical examination, immunization, or other reason. The records of all types of physical examinations, both in and out of school and for persons of all ages and both sexes, afford data on the extent of medical examinations in the course of a year in a fairly representative general population group. The composition and characteristics of this group of 8,758 families who were kept under observation for 12 consecutive months in the years 1928–31 have already been considered in some detail in the report on illness (5) These families, including a total of 39,185 individuals, resided in 18 States, representing every geographical section Every size of community was included, from metropolitan districts to small industrial and agricultural towns and rural unincorporated areas. Although not identical with the general population, the persons in the observed families were fairly typical with respect to age and sex distribution, percentage native born, and percentage married. With respect to income, their distribution was reasonably similar to the estimated distribution of the general population of the United States at the time of the survey.

TOTAL MEDICAL CARE

In a sense every visit to a physician may be considered a check-up of the physical condition of the person. The extent to which this is true depends upon the thoroughness with which the physician examines his patient to make a diagnosis of the symptoms that caused him to consult the doctor. During the 12 months of the observation record for these families, 48 percent of the individuals in the group received from a physician some care for illness, a physical examination, an immunization, or some other kind of professional service Considering the services of dentists and optometrists or opticians as well as physicians, 62 percent of the population under observation had some medical, dental, or eye care in the course of the year [1] It may be assumed, however, that dentists, optometrists, and opticians gave little or no consideration to the general physical condition of their patients, as it would hardly fall within the scope of their professions. Also, a physician in making a vaccination or other immunization would

[1] The percentage of the population which had certain services during the year varies considerably with income. For example, 43 percent of the members of families having a total annual income of less than $1,200 had the service of a physician as against 67 percent in families with an income of $10,000 or more; similarly the percentage of individuals having dental care ranged from 10 percent in the income class under $1,200 to 60 percent in the class of $10,000 and over, and the percentage of individuals having no medical, dental, or eye care ranged from 47 percent for the income class under $1,200 to 14 percent for families with $10,000 and over. For more details on the variation in service received by different income groups, see publications of the Committee on the Costs of Medical Care (7, 8).

probably consider the patient's general condition only in rare instances of extreme ill health; and the same may often be true in many minor illnesses.

To state the matter of professional care in the negative way, 52 percent of the observed population received no service from physicians for any purpose and 38 percent received no service from physicians, dentists, optometrists, or opticians during the year.

FREQUENCY OF EXAMINATIONS OF DIFFERENT TYPES

The present paper considers only examinations of apparently well persons for presumably preventive purposes and excludes all procedures made for the purpose of diagnosing a case of illness. Such examinations of well persons are far less frequent in the general population than medical attendance upon illness. Health examinations are divided into "complete examinations", in which some consideration was presumably given to all parts of the body, and "check-up examinations", in which certain organs of the body (such as chest, lungs, nose, throat, kidneys) were given special consideration and other parts were given secondary or possibly no consideration. The designation "complete examination" has no reference to the thoroughness or care with which the work was done, for many of the examinations so classified appear to be of a very cursory nature

In the total surveyed group there were during the year 78.4 complete examinations per 1,000 persons under observation (table 1). In addition, there were 12.5 examinations to check up particular parts or organs of the body, exclusive of 21 9 cases of prenatal care,[2] 6.3 post-partum [2] examinations, and 39.6 eye refractions per 1,000 total population Prenatal care often included several examinations, but in the above statement the series of check-ups is counted as a single case

The complete examination rate of 78 4 per 1,000 consisted of 24.3 cases per 1,000 of infant and child supervision, 26 5 school examinations, 13.6 other examinations (outside of school) of school and preschool children, and 14 0 other examinations of adults and older children not reported as attending school,[2] including examinations at any age for insurance. In a later section examination rates will be considered for children of specific ages whether made in or out of school. For infants under 1 year of age there were frequently several examinations in the program of well-baby care, but the whole series is counted as a single case in this paper. The number of consultations per examination, which will be considered later, indicates how many visits, on the average, were included in the series.

[2] Rates are computed as per 1,000 total population as a measure of the extent of each kind of examination or check-up in the total group, even though some of the categories refer only to specific groups, viz, pregnant women, infants, school children, etc.

TABLE 1.—*Physical examinations of various kinds per 1,000 persons in canvassed white families in 18 States during 12 consecutive months, 1928–31*

Kind of examination	Examinations per 1,000 total population per year					Number of examinations				
	All ages			Both sexes		All ages [1]			Both sexes	
	Both sexes	Male	Female	Under 20	20 and over	Both sexes [1]	Male	Female	Under 20	20 and over
Total complete and check-up examinations	90 9	84 0	97 5	144 7	39 2	3,502	1,588	1,913	2,727	765
Complete examinations	78 4	74 2	82 4	132 4	26 6	3,021	1,403	1,617	2,495	519
School examinations of school and preschool children	26 5	23 7	29 2	53 3	9	1,022	448	574	1,004	18
Other examinations of school and preschool children	13 6	13 0	14 2	27 5	2	523	245	278	519	4
Infant and child supervision	24 3	25 2	23 4	49 8	------	938	477	460	938	------
Examinations for insurance	2 2	3 1	1 3	7	3 6	84	58	26	13	71
Other examinations of older children and adults	11 8	9 3	14 2	1 1	21 8	454	175	279	21	426
Check-up of certain organs or parts of the body	12 5	9 8	15 1	12 3	12 6	481	185	296	232	246
Examination of tuberculosis contacts	3 06	2 54	3 57	4 93	1 28	118	48	70	93	25
Chest or other part of respiratory tract except nose and throat	2 05	1 48	2 60	2 23	1 85	79	28	51	42	36
Check-up or series of check-ups of an arrested tuberculosis case	93	58	1 27	58	1 28	36	11	25	11	25
Nose and throat check-up	1 01	95	1 07	1 38	67	39	18	21	26	13
Kidney and urinary system	1 43	1 38	1 48	85	2 00	55	.26	29	16	39
Genital organs, including Wassermann tests	80	37	1 22	27	1 33	31	7	24	5	26
Heart and circulatory system	47	53	41	27	67	18	10	8	5	13
Cancer, diabetes and other general noninfectious diseases	47	32	61	21	72	18	6	12	4	14
Ear	31	16	46	32	31	12	3	9	6	6
Communicable disease contacts	31	21	41	58	05	12	4	8	11	1
Orthopedic cases	29	32	.25	21	36	11	6	5	4	7
Other and ill-defined conditions	1 35	95	1 73	.48	2 10	52	18	34	9	41
Population (years of life)	------	------	------	------	------	38,544	18,896	19,627	18,846	19,511

[1] "All ages" includes a few of unknown age, "both sexes" includes a few of unknown sex

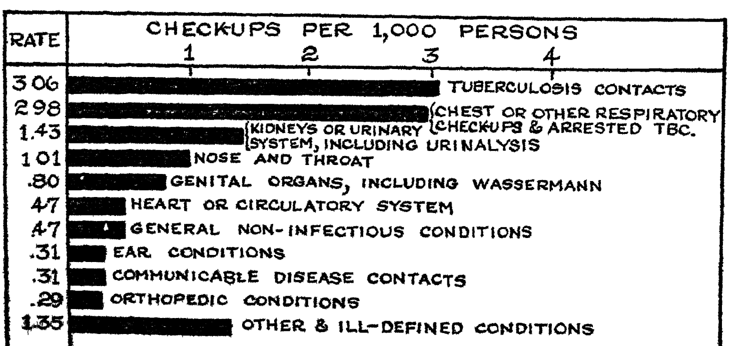

FIGURE 1.—Check-up examinations for specific conditions per 1,000 total population—canvassed white families in 18 States during 12 consecutive months, 1928–31.

The check-up examinations were made for a variety of reasons, but the preponderance relates to the chest or lungs, although a fairly small proportion is actually designated as check-ups to determine whether tuberculosis is present. Of the total of 12 5 check-ups per 1,000 population, 6, or nearly half, had some relation to tuberculosis. Of these, 3.1 per 1,000 were examinations of contacts of tuberculosis, 2 were examinations of the chest or lungs or other part of the respira-

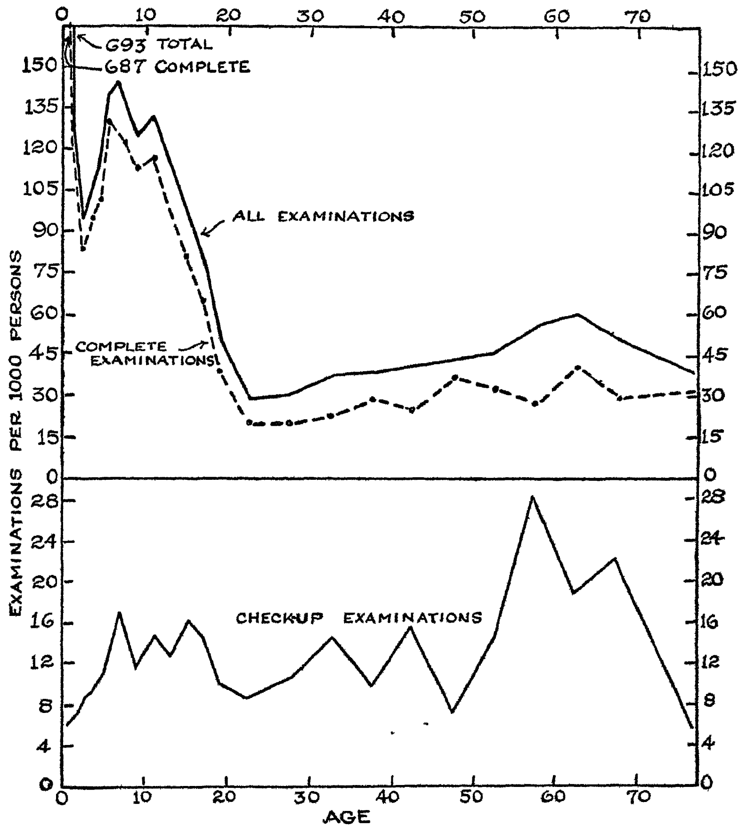

FIGURE 2 —Physical examinations per 1,000 persons of specific ages—canvassed white families in 18 States during 12 consecutive months, 1928-31

tory tract except the nose and throat, and 0 9 per 1,000 were check-ups or a series of check-ups on arrested cases of tuberculosis. In addition, check-ups on the nose and throat amounted to 1 per 1,000 population. The check-ups on the kidneys or urinary system (including urinalysis without other information as to the reason for check-up) amounted to 1.4 per 1,000. Figure 1 shows graphically the frequency of the various types of check-up examinations.

FREQUENCY OF EXAMINATIONS AT DIFFERENT AGES

Table 2 and figure 2 show the examinations per 1,000 persons of each age, the ages under 8 being in single years and those from 8 to 19 in 2-year groups It will be seen that the examination rates for children under 1 year of age are far greater than at any other age It must be remembered that every community represented in this study had one or more visiting nurses, and infant care was probably an important part of the nursing program The rate of 693 examinations [3] per 1,000 infants is not greatly different from the findings of a White House Conference (12) Survey of 156 cities, which showed that about half of the infants have a health examination by the time they are a year old. After infancy, examinations are much less frequent, reaching a minimum for preschool children of 94 per 1,000 at 2 years of age The frequency increases for ages 3, 4, and 5, probably because of the examinations preceding entrance into school, with a second maximum rate of 145 per 1,000 for 6-year-old children With the exception of a small peak at 10 to 11 years of age, there is a declining rate for the remainder of the school ages. The rate for the 20–24 year group is 29 per 1,000, or only one fifth of the 6-year rate and one fourth of the 12–13 year rate. In the adult ages there is a general tendency for examination rates to increase with age, but the maximum of 60 per 1,000 at 60 to 64 years is far below rates for the school ages, and the maximum of 145 per 1,000 at 6 years seems too low to include all school examinations.[4]

The age curve of complete examinations is very similar to that of all examinations, since the complete class constitutes a very large proportion of the total reported Cases of infant supervision have been counted as complete examinations because there is presumably no particular organ or part of the body that is given special attention.

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[3] As compared to rates for other ages in this study the examination rate for children under 1 year of age is an understatement because a series of examinations classed as infant supervision has been counted as only one case Of these infant examination cases, 49 percent had 4 or more calls to the physician, the average number of visits per case (series) being 5 2 calls

[4] Several things suggest that the reports from the families do not include all of the school examinations Since there is no fee and often no consent asked of the parent, many children may not even mention the school examination to the family

According to the report on medical inspection of the schools of New York State (16), more than three fourths of the public-school children are examined during a school year Reports from the families in New York State indicate that less than half that many of the children of school age were examined

The Detroit Health Department reports that 38 percent of the school children were examined during the school year 1929–30 (3), but the Detroit families reported only about one fourth of the children of school age as being examined

On the other hand, there are no doubt many places in the United States where no school examinations are given at any time during the child's whole school career Rogers (14) states that "recent investigations (referring to unpublished data) indicate that not more than half of the children in the public schools of the United States have ever had their eyes examined " It is probably safe to assume that the proportion who have had a physical examination is less than that for an eye test If less than half of the children are examined in the course of a large part of their school life, an *annual* examination rate of 10 to 15 percent for school children in this study would seem to be reasonably complete It seems probable that the recorded examination rates for the school ages are somewhat lower than the real situation in the places surveyed But the places surveyed all had one or more visiting nurses and most of them had health departments, and they may examine a higher proportion of their school children than is true in the United States as a whole

The examination of adults is largely in private practice, and it is probable that the reports are rather complete, because the study emphasized costs and the examination would nearly always involve a fee

TABLE 2.—*Physical examinations per 1,000 persons of specific ages in canvassed white families in 18 States during 12 consecutive months, 1928–31*

Age in years	Examinations per 1,000 population per year					Number of examinations					Population (years of life)
	Total complete and check-up			All places of examination		Total complete and check-up			All places of examination		
	All places	In public clinics	In private practice	Complete	Check-up	All places	In public clinics	In private practice	Complete	Check-up	
All ages [1]	90 9	50 3	40 6	78 4	12 5	3,502	1,939	1,563	3,021	481	38,544
Under 1	692 9	281 8	411 1	686 9	6 1	686	279	407	680	6	990
1	127 7	81 7	46 0	120 5	7 1	161	103	58	152	9	1,261
2	93 9	69 9	23 9	85 2	8 6	98	73	25	89	9	1,044
3	105 4	74 6	30 8	96 1	9 3	113	80	33	103	10	1,072
4	116 1	87 3	28 8	102 1	11 2	133	100	33	117	16	1,146
5	139 9	111 8	28 1	131 4		164	131	33	154	10	1,172
6	145 1	116 6	28 5	126 1	17 2	168	135	33	146	22	1,158
7	138 3	109 3	29 0	123 0		162	128	34	144	18	1,171
8–9	125 1	107 9	17 2	113 4	11 7	277	239	38	251	26	2,214
10–11	132 3	105 1	27 3	117 7	14 6	262	208	54	233	29	1,980
12–13	113 5	83 7	29 8	100 9	12 6	198	146	52	176	22	1,744
14–15	97 4	65 4	32 0	81 0	16 3	149	100	49	124	25	1,530
16–17	79 5	40 9	38 6	64.8	14 7	103	53	50	84	19	1,296
18–19	49 6	18 7	30 9	39 3	10 3	53	20	33	42	11	1,068
20–24	28 8	8 0	20 8	20 3	8 5	61	17	44	43	18	2,119
25–29	30 9	5 2	25 7	20 5	10 4	77	13	64	51	26	2,491
30–34	37 5	0 2	28 3	22 9	14.6	118	29	89	72	46	3,149
35–39	38 3	8 2	30 1	28.6	9 7	126	27	99	94	32	3,292
40–44	40 6	11 4	29 2	25 0	15 5	107	30	77	66	41	2,638
45–49	43 6	7 8	35 8	36 3	7 3	84	15	69	70	14	1,928
50–54	45 7	3 5	42 2	31 6	14 1	65	5	60	45	20	1,423
55–59	54 9	2 4	52 5	26 3	28 6	46	2	44	22	24	838
60–64	59 8	6 3	53 5	40 9	18 9	38	4	34	26	12	635
65–69	50 8	2 2	48 6	28 7	22 1	23	1	22	13	10	453
70 and over	36 7	1 8	34 9	31 2	5 5	20	1	19	17	3	545

[1] "All ages" includes a few of unknown age. Ages of persons and cases under 12 months old are computed in months. The "years of life" under 1 year old includes only the observation time of the infant up to 12 months of age, his observation time and cases after that date being counted with the 1-year-olds. This accounts for the smaller number of years of life under 1 year and the larger number of years of life at 1 year of age.

There are few check-up examinations under 1 year of age. As age increases, the number of check-ups increases, with relatively high rates from 6 to 17 years. These high rates at the school ages may represent check-ups by private physicians of conditions that were called to the attention of the parent by the school examination. After a decrease at 20 to 24 years, the rate fluctuates around approximately the same level until about 55 years, and there is a very definite increase for the ages 55 to 70 years. After 70 fewer check-ups are made.

FREQUENCY OF EXAMINATIONS AMONG MALES AND FEMALES

Table 3 and figure 3 show examination rates by sex and age. When the data are arranged by 5-year groups, children under 5 show a higher examination rate than any other age group, due in large part to examinations or health supervision of infants under 1 year. For all age groups under 55 years, examinations are reported more frequently among females than among males, but the reverse is true above that age. The relative differences between the sexes are greater for check-up examinations; no material difference occurs under 5 years in complete examinations. The higher rate for males above 55 years is true for both complete and check-up examinations.

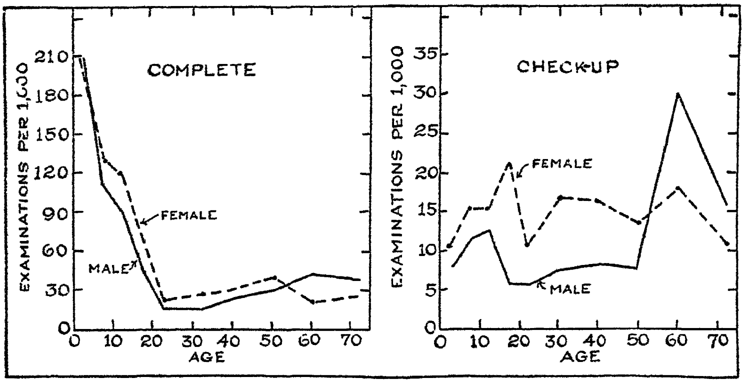

FIGURE 3.—Physical examinations per 1,000 males and females of specific ages—canvassed white families in 18 States during 12 consecutive months, 1928–31

TABLE 3.—*Physical examinations per 1,000 males and females of different ages in canvassed white families in 18 States during 12 consecutive months, 1928-31*

Sex and kind of examination	All ages [1]	Under 5	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65 and over
	Examinations per 1,000 population per year										
Total complete and check-up											
Both sexes	90.9	216.0	134.9	118.4	73.4	28.8	34.6	39.3	44.5	57.0	43.1
Male	84.0	215.8	122.7	102.6	50.4	22.4	22.9	31.9	37.4	72.1	52.6
Female	97.5	217.6	146.8	131.5	96.5	33.5	43.2	46.8	53.1	38.9	35.7
Complete examinations											
Both sexes	78.4	[2] 207.0	121.6	104.4	59.7	20.3	21.8	27.0	34.3	32.6	30.1
Male	74.2	208.0	111.3	90.0	44.5	16.8	15.4	23.5	28.8	42.3	36.6
Female	82.4	207.2	131.6	119.1	74.9	22.9	26.6	30.5	39.8	20.9	25.0
Check-up examinations											
Both sexes	12.5	9.1	13.3	14.0	13.8	8.5	12.8	12.3	10.1	24.4	13.0
Male	9.8	7.8	11.3	12.6	5.9	5.6	7.5	8.4	7.6	29.9	16.0
Female	15.1	10.4	15.2	15.4	21.7	10.6	16.7	16.3	13.3	17.9	10.7
	Number of examinations										
Total complete and check-up											
Both sexes [2]	3,502	1,191	771	541	224	61	195	233	149	84	43
Male	1,588	606	346	236	77	20	55	95	69	58	23
Female	1,913	584	425	305	147	41	140	138	80	26	20
Complete examinations											
Both sexes [2]	3,021	1,141	695	477	182	43	123	160	115	48	30
Male	1,403	584	314	207	68	15	37	70	55	34	16
Female	1,617	556	381	270	114	28	86	90	60	14	14
Check-up examinations											
Both sexes [2]	481	50	76	64	42	18	72	73	34	36	13
Male	185	22	32	29	9	5	18	25	14	24	7
Female	296	28	44	35	33	13	54	48	20	12	6
	Population (years of life)										
Both sexes [2]	38,544	5,513	5,715	4,568	3,050	2,119	5,640	5,930	3,351	1,473	998
Male	18,896	2,808	2,820	2,301	1,527	894	2,402	2,979	1,845	804	437
Female	19,627	2,684	2,895	2,267	1,523	1,225	3,238	2,951	1,506	669	561

[1] "All ages" incudes a few of unknown age
[2] "Both sexes" includes a few of unknown sex.

Table 1 indicates that for each of the 4 classes of complete examinations, except infant supervision, and for 10 of the 12 classes of check-up examinations shown in that table, the rates are slightly higher for females than for males. In the 2 classes in which the rates are higher for males, the numbers are small.

FREQUENCY OF EXAMINATIONS AMONG MARRIED AND SINGLE PERSONS

In table 4 examination rates are shown for married and single persons 20 to 34 years of age. Below these ages there are so few married and above so few single persons that comparison does not seem worth while. Examination rates do not vary greatly from 20 to 34 years, and so the data are shown only for the total of those ages. Fewer complete but more check-up examinations were reported among married than among single persons. This statement is true for both males and females, but the differences are greater for the latter.

TABLE 4.—*Physical examinations per 1,000 single and married persons 20 to 34 years of age—canvassed white families in 18 States during 12 consecutive months, 1928–31*

Marital status	All examinations			Complete examinations			Check-up examinations			Population (years of life)		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
	Examinations per 1,000 persons 20 to 34 years of age											
Single	34.8	21.7	48.3	27.6	16.3	39.3	7.2	5.4	9.0			
Married	32.5	23.3	38.8	19.4	15.7	22.0	13.1	7.6	16.8			
	Number of examinations											
Single	63	20	43	50	15	35	13	5	8	1,812	922	890
Married	191	55	136	114	37	77	77	18	59	5,869	2,364	3,505

FAMILY INCOME AND FREQUENCY OF EXAMINATIONS

As might have been anticipated, physical examinations are considerably more frequent among the higher income groups than in the lower income classes. Table 5 shows examination rates per 1,000 persons in each of five income groups. With the exception of the lowest class, there is a constantly rising examination rate as income increases. If infant supervision is excluded, the increase with income is more marked.[5] In the families with incomes of $5,000 or over, the total examination rate (exclusive of infant supervision) is more than 2½ times that in the lower income groups, while the examination rate in families with incomes of $10,000 or over is more than 4 times that in the groups with incomes under $2,000.

[5] The higher examination rates in the low income classes for infant supervision appear to be largely the result of more infants, since the examinations are related to the total population and not to the infant population when rates for all ages are computed.

TABLE 5.—*Physical examinations per 1,000 persons in canvassed white families of different income levels in 18 States during 12 consecutive months, 1928–31 (all types of examinations)*

Annual family income	All ages [1] Including infant and child supervision	All ages [1] Excluding infant and child supervision	Under 5 Including infant and child supervision	Under 5 Excluding infant and child supervision	5–14 Including infant and child supervision	5–14 Excluding infant and child supervision	15–24	25–44	45–64	65 and over
	Examinations per 1,000 population per year									
Under $1,200	93.8	52.2	267.2	42.6	125.1	109.9	38.7	24.9	9.2	8.1
$1,200 but under $2,000	76.8	51.3	176.9	35.2	127.4	120.3	32.1	18.2	18.3	7.1
$2,000 but under $3,000	75.9	56.7	187.6	57.7	106.5	104.9	50.5	28.4	33.3	42.3
$3,000 but under $5,000	86.3	70.7	221.8	82.7	122.5	119.9	56.6	50.3	42.0	64.3
$5,000 and over	154.6	136.7	391.6	177.5	177.9	175.9	117.0	109.5	135.1	135.8
	Number of examinations									
Under $1,200	546	304	257	41	215	189	30	36	6	2
$1,200 but under $2,000	1,031	689	392	78	483	456	55	74	24	2
$2,000 but under $3,000	720	538	257	79	269	265	61	87	37	8
$3,000 but under $5,000	424	347	118	44	142	139	42	80	30	9
$5,000 and over	725	641	150	68	179	177	89	147	134	22
	Population under observation [2]									
Under $1,200	5,820		962		1,719		775	1,447	649	247
$1,200 but under $2,000	13,419		2,216		3,790		1,715	4,060	1,313	283
$2,000 but under $3,000	9,491		1,370		2,527		1,207	3,058	1,110	189
$3,000 but under $5,000	4,911		532		1,159		742	1,592	715	140
$5,000 and over	4,689		383		1,006		761	1,343	992	162

[1] "All ages" includes a few of unknown age.
[2] Nearly all persons were under observation the whole 12 months. For births during the study an adjustment was made to reduce their observation period to full-time years of life.

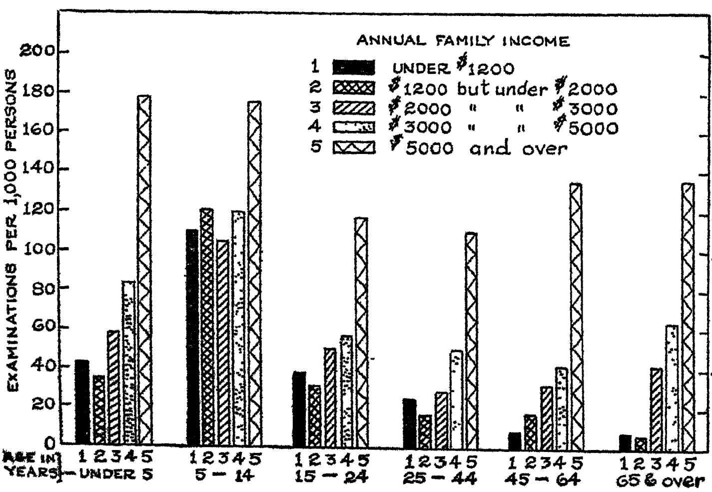

FIGURE 4.—Physical examinations per 1,000 persons of specific ages in different income levels—canvassed white families in 18 States during 12 consecutive months, 1928–31. (Infant and child supervision are not included as examinations in this chart.)

Considering examinations at specific ages in the different groups (fig 4) it will be noted that the rates for the upper income classes are consistently higher in the various age groups At the school ages in which most of the examinations are made in school, the rates are practically the same except in families with an income of $5,000 or above. Even in these higher income families, rates for children 5 to 14 years old are only about 50 percent in excess of those for the same ages in families with less than $1,200 income, but in both the age groups 45–64 and 65 years and over, examination rates for persons in families with $5,000 or more income are about 15 times those in the class under $1,200. In the older ages where most of the examinations are the work of private practitioners, income is a very important factor in their frequency.

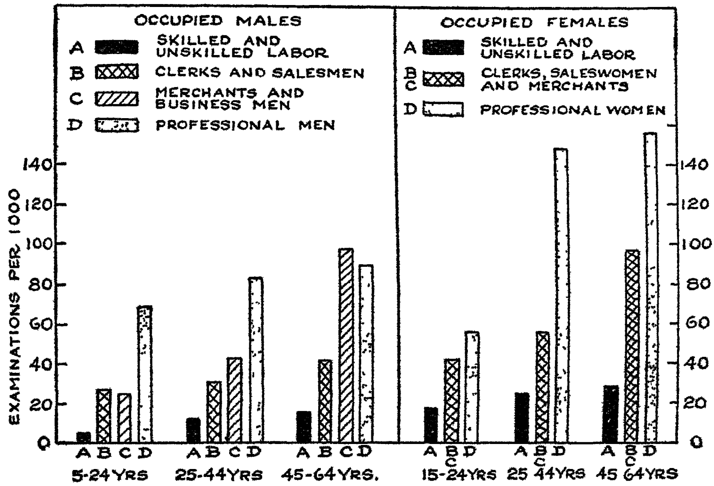

FIGURE 5 —Physical examinations per 1,000 males and females of specific ages in certain occupations—canvassed white families in 18 States during 12 consecutive months, 1928–31

OCCUPATION AND THE FREQUENCY OF EXAMINATIONS

The occupation of each individual was recorded on the schedule. As income is related to occupation, one would expect the frequency of examinations to vary with occupation. However, it is of interest to see what kinds of occupations have more frequent examinations. With the small numbers of examinations it is possible to use only broad groups rather than specific occupations. Table 6 and figure 5 show examination rates among employed males and females of different occupations. The highest rates occur among professional men and women and the lowest among those in laboring groups.

The table includes data for farmers and for housewives on the farm and in towns and cities. The frequency of examinations is approximately the same for farmers and farmers' wives, but the rates for town and city housewives are about twice those for farm housewives.

TABLE 6.—*Physical examinations per 1,000 persons in certain occupations—canvassed white families in 18 States during 12 consecutive months, 1928–31*

Occupation	Examinations per 1,000 population per year				Number of examinations				Population			
	Total 15–64	15–24	25–44	45–64	Total 15–64	15–24	25–44	45–64	Total 15–64	15–24	25–44	45–64
	Males											
Professional men	84 6	69 0	82 9	89 4	56	2	33	21	662	29	398	235
Merchants and business men	64 6	25 6	43 6	97 9	85	1	33	51	1,316	39	756	521
Clerks and salesmen	32 8	26 7	31 4	41 8	48	7	28	13	1,464	262	891	311
Skilled and unskilled labor	12 0	5 0	12 4	15 4	48	3	30	15	3,984	597	2,412	975
Farmers and farm laborers	19 8	29 0	23 2	11 6	19	4	11	4	958	138	475	345
	Females											
Professional women	125 5	56 0	148 8	156 3	60	7	43	10	478	125	289	64
Clerks, saleswomen, and merchants	51 7	42 1	55 4	96 8	39	17	16	6	755	404	289	62
Skilled and unskilled labor	22.7	17 9	25 3	28 6	9	3	4	2	396	168	158	70
All housewives [1]	38 6	27 1	38 0	44 7	305	19	203	83	7,897	701	5,340	1,856
Town or city housewives	42 5	27 7	41 2	52 2	278	16	185	77	6,548	578	4,495	1,475
Farm housewives	20 0	24.4	21 3	15 7	27	3	18	6	1,349	123	845	381

[1] "Housewife" here means a person in charge of the home and therefore includes a few single women

The examination rate for persons 15 to 24 years of age who are attending school is about three times that for working persons of those ages. This is true for both males and females.

Among men 65 years old and over, the examination rate for those still employed is more than twice the rate for those no longer working. So few women over 65 years were still employed that a similar comparison could not be made for them.

FREQUENCY OF EXAMINATIONS IN URBAN AND RURAL AREAS

Examination rates per 1,000 for the 12-month period of the study are shown for four sizes or kinds of communities in table 7. With the rather inconsistent and inconclusive results, it can only be suggested that size of city is not a major factor in the frequency of physical examinations. Nor do rates in the four types of communities for persons of specific income classes show any consistent variation in the frequency of examination as related to size of city or town.

TABLE 7.—*Physical examinations per 1,000 persons in urban and rural communities—canvassed white families in 18 States during 12 consecutive months, 1928–31 (all types of examinations)*

Population of city or town	All ages [1]		Under 5		5–19		20–44	45 and over
	Including infant and child supervision	Excluding infant and child supervision	Including infant and child supervision	Excluding infant and child supervision	Including infant and child supervision	Excluding infant and child supervision		
	Examinations per 1,000 population per year							
Cities of 100,000 or over	90.7	65.8	235.4	56.0	109.6	108.3	41.2	46.9
Cities of 5,000 but under 100,000	93.5	59.7	232.6	42.3	84.0	73.6	37.7	103.2
Towns under 5,000	113.6	89.3	223.1	78.4	187.1	179.2	31.3	21.7
Rural areas	62.5	52.6	135.1	60.2	92.3	91.6	23.7	13.1
	Number of examinations							
Cities of 100,000 or over	1,302	944	462	110	505	499	228	101
Cities of 5,000 but under 100,000	906	579	357	65	284	240	130	134
Towns under 5,000	862	677	253	89	501	480	81	25
Rural areas	432	364	119	53	246	244	50	16
	Population (years of life)							
Cities of 100,000 or over	14,351		1,963		4,609		5,540	2,155
Cities of 5,000 but under 100,000	9,694		1,535		3,381		3,449	1,298
Towns under 5,000	7,585		1,134		2,678		2,589	1,151
Rural areas	6,914		881		2,665		2,111	1,218

[1] "All ages" includes a few of unknown age

SICKNESS AND THE FREQUENCY OF EXAMINATIONS

The sickness and examination records on the same individuals for the 12-month period make it possible to determine whether those persons who were not sick during the year or those who were sick several times were more inclined to go to physicians and clinics for physical examination It must be remembered that the examinations under consideration exclude all procedures to diagnose a case of illness and are presumably of well persons for preventive purposes only. Figure 6 shows the proportion of individuals who had an examination among persons not sick, sick once, sick twice, and sick three or more times during the year under observation. It is immediately apparent that those individuals who are most frequently sick are the ones who are most likely to go to the doctor for a health examination. Twice as many of those who were sick three or more times during the 12-month period had an examination as of those who reported no illness.

TABLE 8.—*Physical examinations [1] among persons classified according to the number of times sick during the year under observation—canvassed white families in 18 States during 12 consecutive months, 1928–31*

	Percentage of persons who had a physical examination [1] of any kind during the year						Total number of persons under observation [2]					
	All ages over 1 year	1–4	5–14	15–19	20–44	45 and over	All ages over 1 year	1–4	5–14	15–19	20–44	45 and over
All incomes												
Both sexes												
Not sick	4.6	3.6	9.1	5.7	2.2	2.7	17,527	1,364	4,804	1,785	6,798	2,776
Sick once	6.2	5.8	11.7	4.7	3.4	3.8	11,836	1,453	3,318	882	4,280	1,903
Sick twice	7.8	4.8	13.1	8.5	4.7	7.5	4,927	786	1,404	272	1,677	788
Sick 3 or more times	10.8	10.3	16.5	12.6	7.7	7.2	2,477	524	674	111	836	332
Male												
Not sick	4.0	3.7	8.1	3.8	1.9	2.7	9,266	702	2,357	911	3,640	1,656
Sick once	5.7	6.3	10.0	3.7	2.9	3.8	5,597	750	1,693	437	1,779	938
Sick twice	6.9	4.1	11.3	2.6	3.9	7.7	2,116	393	683	117	561	362
Sick 3 or more times	11.7	11.7	15.6	13.7	6.7	8.7	1,024	281	352	51	225	115
Female												
Not sick	5.4	3.5	10.1	7.6	2.6	2.7	8,261	662	2,447	874	3,158	1,120
Sick once	6.6	5.3	13.4	5.6	3.8	3.8	6,239	703	1,625	445	2,501	965
Sick twice	8.4	5.6	14.8	12.9	5.0	7.3	2,811	393	721	155	1,116	426
Sick 3 or more times	10.1	8.6	17.4	11.7	8.0	6.5	1,453	243	322	60	611	217
Both sexes												
Family income under $3,000												
Not sick	3.8	3.0	8.4	4.0	1.5	1.0	13,406	1,186	3,948	1,291	5,103	1,878
Sick once	5.5	5.0	11.6	3.6	2.1	2.3	8,853	1,229	2,623	638	3,139	1,224
Sick twice	6.3	4.1	13.0	8.1	2.9	2.7	3,521	615	1,035	186	1,205	480
Sick 3 or more times	8.6	6.2	16.6	13.3	5.0	4.8	1,646	370	429	60	579	208
Family income $3,000 and over												
Not sick	7.2	7.3	12.3	9.9	4.5	6.1	4,121	178	856	494	1,695	898
Sick once	8.3	9.8	11.9	7.4	7.0	6.6	2,983	224	695	244	1,141	679
Sick twice	11.3	7.6	13.3	9.3	9.1	14.9	1,406	171	369	86	472	308
Sick 3 or more times	15.2	20.1	16.3	11.8	13.6	11.3	831	154	245	51	257	124

[1] Infant and child supervision and the supervision of arrested tuberculosis cases are not included as examinations in this table.
[2] All except about 1.5 percent were under observation the whole 12 months.

As already noted, examinations are closely related to family income. In the lower sections of figure 6, examination rates are shown separately for persons in families with annual incomes under $3,000 and for those with incomes of $3,000 or more. In both groups those persons who were sick three or more times had more frequent examinations than those who were not sick, with rates for persons sick once and twice falling between the two extremes.

Both examination and sickness rates vary considerably with age, and it is necessary to consider the relationship at specific ages. Figure 7 shows the proportion of individuals of specific ages who had an examination among persons not sick, sick once, sick twice, and sick three or more times during the year. In each age group there is a definite tendency for examination rates to increase as the number of times sick increases. Even at the school ages of 5 to 14 years the sickly children had more examinations than the well group. This may have resulted from more service by private physicians to whom delicate and

sickly children were taken for examination, or it may be a manifestation of the "screening" process in school health work by which only

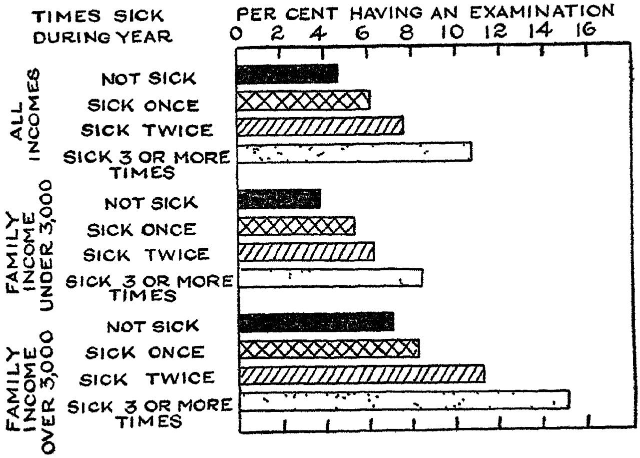

FIGURE 6—Physical examinations among persons classified according to the number of times sick during the year of observation—canvassed white families of two income groups in 18 States during 12 consecutive months, 1928–31 (Infant and child supervision and the supervision of arrested tuberculosis cases are not included as examinations in this chart)

those children are examined by the school physician who are adjudged under par on the teacher's inspection, or who are underweight, or who

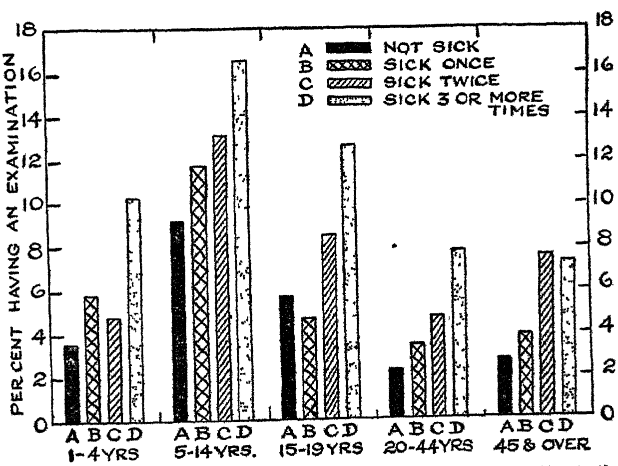

FIGURE 7—Physical examinations among persons of specific ages classified according to the number of times sick during the year of observation—canvassed white families in 18 States during 12 consecutive months, 1928–31 (Infant and child supervision and the supervision of arrested tuberculosis cases are not included as examinations in this chart)

have been absent from school on account of sickness, or who are selected for examination by some similar process.

Reference to table 8 indicates that the relationships discussed above are true for each sex and generally for each age group of each sex.

As mentioned previously, the examinations are presumably for preventive purposes only The few check-ups to determine whether or not a particular disease was present are insufficient to account for the large differences, even though they tended to be concentrated among sickly people.[6] Closer contact with physicians may lead to more frequent examination of persons who have recently been sick, and it may also be that illness calls the attention of an individual to the necessity of examination or other procedures that may prevent or postpone further illness.

EXAMINATIONS IN PUBLIC CLINICS AND PRIVATE PRACTICE

Figure 8 shows the percentage of examinations that were made in public clinics and the percentage made in private practice. For com-

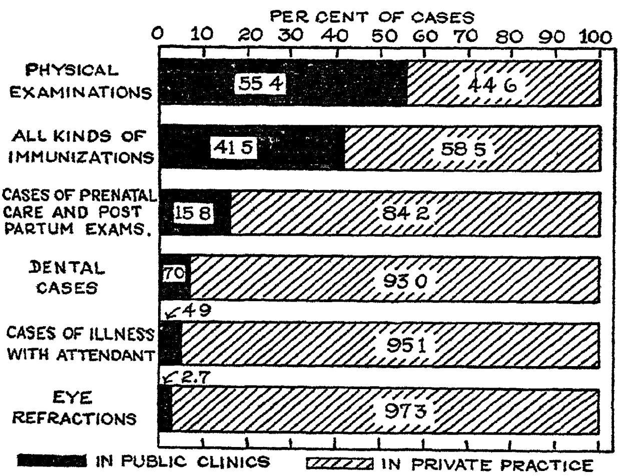

FIGURE 8.—Percent of cases of various kinds of medical care that were handled in public clinics and in private practice—canvassed white families in 18 States during 12 consecutive months, 1928-31

parison, similar percentages are shown for immunizations, for prenatal care and post-partum examinations, for dental work, for eye refractions, and for cases of illness Considering all types of physical examinations, 55 percent were made in public clinics.[7] Complete and check-up examinations are not greatly different in this respect, 56 percent of the complete and 51 percent of the check-ups being made in public clinics. In the case of immunizations a somewhat smaller

[6] Those families whose illness records were most complete would also be most likely to render complete reports of examinations However, it does not appear probable that this factor is important enough to account for the large and consistent differences in the various age and sex groups

[7] In the family income group under \$1,200 and the \$1,200-\$2,000 group 72 and 76 percent, respectively, of the physical examinations were made in public clinics. As income increases, fewer examinations are made in public clinics, and in the \$10,000-and-over class 5 percent of the examinations were made in public clinics.

proportion is done in public clinics, 42 percent A very large percentage of these two types of distinctly preventive services is rendered by public clinics Prenatal care and post-partum examinations may be classed as preventive services, but they are to prevent complications and sequelae rather than the occurrence of the case itself. In another sense they are merely a part of the therapeutic care of a maternity case. These services are rendered rather largely by private practitioners, only 16 percent of the prenatal care and post-partum examinations being done by public clinics, with 84 percent in the hands of private practitioners Other types of cases are almost entirely in the hands of private practitioners, only 7 percent of the dental cases, 5 percent of the cases of illness that had an attendant,[8] and 3 percent of the eye refractions being cared for by public clinics.

The regular school examinations and infant supervision cases constitute a large part of the clinic examinations Of the school examinations, 93 percent were made by public clinics or school physicians, and 56 percent of the infant supervision was under the public clinic or the visiting nurse. Of the nonschool examinations of preschool and school children, 33 percent were done by public clinics, and of the other examinations of older children and adults only 10 percent were done by public clinics.

TABLE 9.—*Proportion of physical examinations that were made by public clinics or other public facilities—canvassed white families in 18 States during 12 consecutive months, 1928–31*

	All examinations	Complete examinations					Check-up examinations				
		All complete	School examinations of school and preschool children	Other examinations of school and preschool children	Infant and child supervision	Other examinations of older children and adults	All check-ups	Tuberculosis contacts	Chest and respiratory system except nose and throat	Arrested tuberculosis	All other check-ups
Percentage of examinations made in public clinics [1]	55.4	56.1	92.5	33.3	55.8	9.9	50.7	89.8	70.9	55.6	25.0
Number of examinations made in public clinics [1]	1,930	1,605	945	174	523	53	244	106	56	20	62
Total number of examinations	3,502	3,021	1,022	523	938	538	481	118	79	36	248

[1] The difference between these percentages and 100 represents the percentage of examinations done in private practice Examinations made by school physicians and infant supervision by visiting nurses are included with those done by public clinics

Considering the different types of check-up examinations, 90 percent of those of tuberculosis contacts, 71 percent of the check-ups of

[8] Of the total cases of illness, 3.9 percent had 1 or more calls to a public clinic, but of the cases that had any medical attendant, 4.9 percent had 1 or more calls to a public clinic

the chest and respiratory system, and 56 percent of the check-ups on arrested tuberculosis cases are done in public clinics, as against 25 percent of all other kinds of check-up examinations.[9]

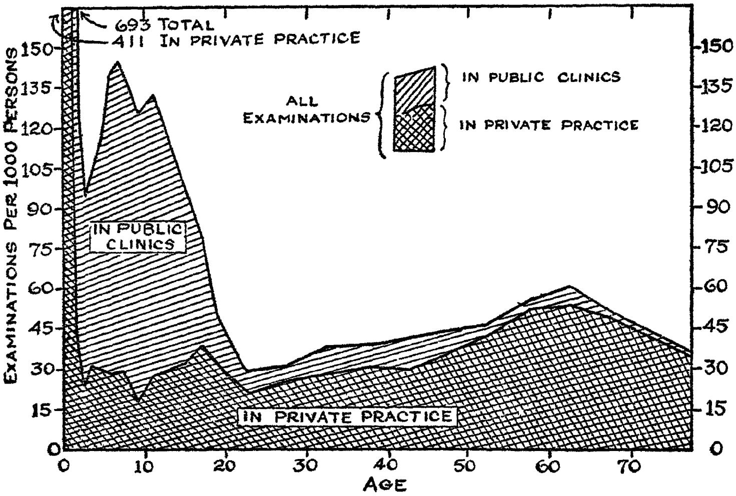

FIGURE 9—Physical examinations in public clinics and in private practice per 1,000 persons of specific ages—canvassed white families in 18 States during 12 consecutive months, 1928–31

Figure 9 shows examination rates per 1,000 persons of different ages for all examinations and for those made in private practice (table 2). The difference between the two curves represents the examination service rendered by public clinics With the exception of frequent examinations of infants and a gradual rise to a peak at 60 to 64 years of age, the rates for private practice do not vary greatly

[9] The following table shows for the various types of examinations the percentage of the public clinic examinations that were reported as entirely free Of all examinations made in public clinics, 93 percent were reported as made with no charge whatever, the other 7 percent includes those with a nominal fee as well as the few that were on a real pay basis

Proportion of public clinic examinations that were made without charge—canvassed white families in 18 States during 12 consecutive months, 1928–31

	All examinations	Complete examinations					All check-up examinations
		All complete	School examinations of school and preschool children	Other examinations of school and preschool children	Infant and child supervision	Other examinations of older children and adults	
Percentage of public clinic examinations that were free	93.5	93.4	99.8	84.5	88.6	50 9	94 0
Number of public clinic examinations that were free	1,714	1,527	943	147	410	27	187
Total number of public clinic examinations with known pay status	1,834	1,635	945	174	463	53	199

with age. The discontinuance of examinations by the schools and other public clinics would reduce the rate under 20 years of age to a fraction of that shown in the figure, but would not change materially the frequency of examination above 45 years and not greatly the rates for the ages from 20 to 45.

TABLE 10.—*Proportion of physical examinations at different ages that were made by public clinics or other public facilities—canvassed white families in 18 States during 12 consecutive months, 1928–31*

Age in years	Percentage of examinations made in public clinic [1]			Number of examinations made in public clinic [2]		
	Complete and check-up	Complete	Check-up	Complete and check-up	Complete	Check-up
All ages	55.4	56.1	50.7	1,939	1,695	244
Under 1	40.7	40.4	66.7	279	275	4
1	64.0	63.2	77.8	103	96	7
2–3	72.5	72.4	73.7	153	139	14
4–5	77.8	80.4	50.0	231	218	13
6–7	79.7	80.7	72.5	263	234	29
8–9	86.3	85.7	92.3	239	215	24
10–11	79.4	79.8	75.9	208	186	22
12–13	73.7	72.2	86.4	146	127	19
14–15	67.1	69.4	56.0	100	86	14
16–17	51.5	53.6	42.1	53	45	8
18–19	37.7	40.5	27.3	20	17	3
20–24	27.9	23.3	38.9	17	10	7
25–34	21.5	8.1	44.4	42	10	32
35–44	24.5	13.8	47.9	57	22	35
45–54	13.4	12.2	17.6	20	14	6
55–64	7.1	2.1	13.9	6	1	5
65 and over	4.7	----------	15.4	2	----------	2
Under 20	65.8	65.7	67.7	1,795	1,638	157
20–44	23.7	12.9	45.4	116	42	74
45 and over	10.1	7.8	15.7	28	15	13

[1] The difference between these percentages and 100 represents the percentages of examinations done in private practice. Examinations made by school physicians and infant supervision by visiting nurses are included with those done by public clinics.

[2] See table 2 for total numbers of examinations in all places.

In figure 10 the public-private character of the examination service has been plotted on a percentage basis (table 10). Starting with a figure of 41 percent of the examinations under 1 year of age being made by public clinics, the proportion increases rapidly to a maximum of 87 percent for the 8–9 year age group, after which it declines rapidly to 20 years and then gradually to the end of life. At no age above 25 years does the public clinic make as many as one fourth of the examinations, and for the ages above 65 years less than 5 percent of the examinations are made in public clinics.

For the ages under 20 years, about the same proportion of complete and check-up examinations are made in public clinics, but for adults the proportion of check-ups made in public clinics is greater than in the case of complete examinations. In the ages 20 to 44 years, 45 percent of the check-ups are made by public clinics, as against 13 percent of the complete examinations. For the ages above 45 years 16 percent of the check-ups and 8 percent of the complete examinations are made in public clinics.

TABLE 11.—*Proportion of laboratory and X-ray work in connection with physical examinations that was done in public or public-clinic laboratories—canvassed white families in 18 States during 12 consecutive months, 1928–31*

	All examinations	Complete examinations	Check-up examinations
Percentage of laboratory or X-ray cases in which work was done in public or public clinic laboratories	39.5	25.8	51.1
Number of laboratory or X-ray cases in which work was done in public or public clinic laboratories	103	31	72
Total number of cases having laboratory or X-ray service with known place of performance	261	120	141

A small proportion of the examinations included laboratory and X-ray work. Of the cases with either of these services, 40 percent had this work done in public or public-clinic laboratories (table 11).

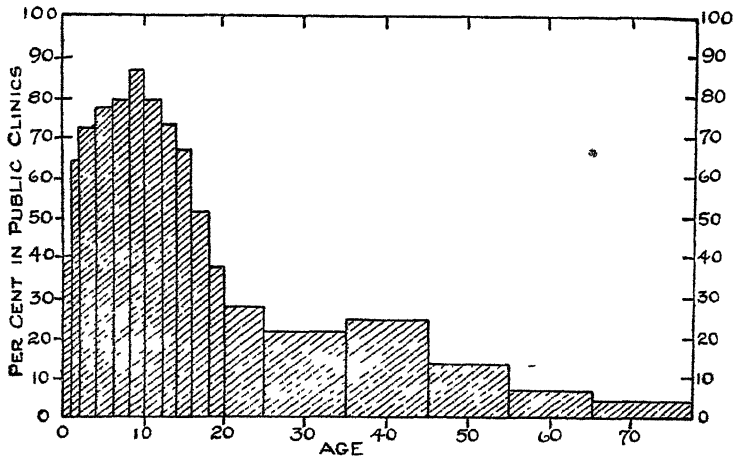

FIGURE 10.—Proportion of physical examinations at specific ages that were made in public clinics—canvassed white families in 18 States during 12 consecutive months, 1928–31

CHARACTER OF THE EXAMINATIONS

Little or no data were included on the nature or thoroughness of the examinations. It is possible, however, to compute the number of calls per examination and the proportion of cases having certain services. These items have been tabulated in table 12. Considering all types of examinations, there was an average of 1.9 calls or visits to the doctor in connection with an examination. The number of calls for all complete examinations except infant supervision was in nearly all instances one per case. A case of infant supervision represents a series of visits to the doctor which amounted to an average of 5.2 calls per case. Of these cases of infant supervision, 76 percent had more than 1 call, and 49 percent had 4 or more calls. For the other three classes of complete examinations, 98 percent or more of the cases had only one call. The average number of calls per check-up

TABLE 12.—*Amount and kind of service received in connection with different types of physical examinations—canvassed white families in 18 States during 12 consecutive months, 1928–31*

	All examinations	Complete examinations: All complete	Complete: School examinations of school and preschool children	Complete: Other examinations of school and preschool children	Complete: Infant and child supervision	Complete: Other examinations of older children and adults	Check-up examinations: All check-ups	Check-up: Tuberculosis contacts	Check-up: Chest and respiratory system except nose and throat	Check-up: Arrested tuberculosis	Check-up: All other check-ups
Visits to examining physician											
Mean calls per case	1.94	2.01	1.00	1.03	5.19	1.07	1.49	1.70	1.39	2.96	1.24
Percentage of cases with only 1 call	81.1	81.3	99.8	98.5	24.2	97.5	80.0	73.5	78.5	44.0	88.3
Percentage of cases with 3 or more calls	14.7	15.0	0.2	0.6	61.3	1.7	12.9	17.1	12.7	44.0	7.0
Total number of cases with known number of calls	3,128	2,694	1,014	520	[1] 636	524	434	117	79	25	[2] 213
Percentage of examinations reported as made by specialists	8.3	7.1	0.5	11.1	12.4	6.7	15.4	5.9	6.3	2.8	24.6
Number of examinations by specialist	289	215	5	58	116	36	74	7	5	1	61
Visiting nurse											
Mean visits per case	0.88	0.95	0.02	0.15	2.96	0.01	0.43	0.89	0.58	1.32	0.05
Mean visits per case having a visiting nurse	4.7	5.1	1.5	2.5	5.3	1.3	2.4	2.7	1.8	4.0	1.3
Percentage of cases having a visiting nurse	18.9	18.9	1.3	6.3	55.7	0.7	18.5	35.6	32.9	33.3	3.6
Number of cases having a visiting nurse	661	572	13	33	522	4	89	42	26	12	9
Total number of cases	3,502	3,021	1,022	523	938	538	481	118	79	36	248
Special X-ray or laboratory service											
Percentage of cases with—											
X-ray service	2.7	1.2	0.5	0.6	---	4.5	11.0	11.0	21.5	16.7	6.9
1 or more laboratory procedures	6.9	4.4	0.7	4.2	1.0	15.6	21.0	5.9	15.2	11.1	31.5
Urinalysis	4.5	3.3	0.3	2.9	0.2	13.0	11.4	---	2.5	---	21.4
All other laboratory procedures	3.3	2.1	0.6	1.9	1.0	6.5	10.2	5.9	13.9	11.1	10.9
Number of cases with—											
X-ray service	85	32	5	3	---	24	53	13	17	6	17
1 or more laboratory procedures	220	119	7	22	6	84	101	7	12	4	78
Urinalysis	144	89	3	15	1	70	55	---	2	---	53
All other laboratory procedures	106	57	6	10	6	35	49	7	11	4	27
Total cases known as to special service	3,183	2,702	1,022	523	619	538	481	118	79	36	248

[1] Data on number of calls to examiner excludes 165 cases of infant supervision in which the only attendant was a visiting nurse.

[2] Data on number of calls to examiner excludes 28 cases of urinalysis by a laboratory with no actual calls to physician or other practitioner.

examination was 1 5 Tuberculosis contacts had 1 7 calls per examination, chest and respiratory examinations had 1.4 calls, but the supervision of arrested tuberculosis averaged 3 0 calls per case, 36 percent of the cases having 4 or more calls For the other check-ups the average number of calls per case was 1 2, and 88 percent of the cases had only one call

Of the complete examinations 7 percent were reported as being made by specialists, and of the check-ups 15 percent were so reported. These figures are a minimum statement, inasmuch as private specialists may have been consulted but reported merely as the family or other physician, and a specialist's work in a clinic may have been reported merely as service by the clinic, with no information about the kind of clinic doctor

Of the complete examinations, 19 percent reported a visiting nurse on the case, but most of the nursing work was on infant supervision, in which 56 percent of the cases had one or more nurse's visits. In other types of complete examinations, nurses' visits are negligible, except nonschool examinations of school and preschool children, of which 6 percent had one or more visits. This suggests the probability that some of these children were taken to private practitioners at the suggestion of the school authorities, since a school nurse, urging the correction of a defect before the child was taken to a physician, would be counted as a nurse on such a case Of all check-up examinations, 19 percent had a visiting nurse. Of the tuberculosis contacts, chest examinations, and arrested tuberculosis supervision, about one third of each class had a visiting nurse, but only 4 percent of all other check-ups had a nurse.

Only 1 percent of the complete examinations had X-ray service, and most of this was on examinations of adults and older children that were largely done in private practice Of the check-ups, 11 percent had some X-ray service, mostly on tuberculosis contacts, chest examinations, and arrested tuberculosis supervision

Of the complete examinations, 4 percent had some laboratory service, 3 percent had urinalysis, and 2 percent had some other laboratory service either alone or in addition to urinalysis. Most of these services also were on examinations of adults and older children, 16 percent of these cases having some laboratory service, 13 percent having urinalysis, and 7 percent having some other laboratory service. Of the check-up examinations, 21 percent had some laboratory service, 11 percent had urinalysis, and 10 percent had laboratory service other than urinalysis.

A report was obtained on complete examinations (exclusive of infant and child supervision) as to whether defects were found (table 13). In 2,000 cases in which this item was recorded, 44 percent were reported as having defects. In the school examinations 55 percent were so reported, and in each of the other two classes 34 percent

indicated that defects were found[10] A further report was obtained as to whether any attempt was made to correct the defects that had been discovered on the examinations Of those persons reported as having defects, 54 percent stated that the defects were being corrected. On the school examinations, where the highest percentage was indicated as having defects, 38 percent stated that the defects were being corrected, but on the other two classes of examinations, largely by private practitioners, 76 and 79 percent stated that the defects were being corrected The higher defect rate and the lower correction rate in the school examinations suggest the possibility of more trivial conditions being reported as defects in school examinations than on the two other classes of examinations On the other hand, those persons who went to private practitioners for examination would be the ones most likely to carry out the advice about corrections.

TABLE 13 —*Defects found and advice given and followed in complete physical examinations—canvassed white families in 18 States during 12 consecutive months, 1928–31*

	Total complete examinations except infant and child supervision	School examinations of school and preschool children	Other examinations of school and preschool children	Other examinations of older children and adults
Defects found on examination				
Number known as to presence of defects	2,000	994	498	508
Number reported as having defects	888	544	170	174
Percentage reported as having defects	44.4	54 7	34 1	34 3
Correction of defects after examination				
Number known as to corrections	847	517	161	169
Number reporting that defects were being corrected	455	199	122	134
Percentage of defectives that were reported as being corrected	53 7	38 5	75 8	79 3
Advice about surgery *to all persons examined*				
Total known as to advice about surgery	1,658	727	456	475
Number advised to have an an operation	194	114	46	34
Percentage of all examined that were advised to have an operation	11 7	15 7	10 1	7 2
Advice about surgery *to those with defects*				
Total known as to advice about surgery	546	277	128	141
Number advised to have an operation	194	114	46	34
Percentage of defectives that were advised to have an operation	35 5	41 2	35 9	24.1
Surgery following advice to operate				
Number known as to performance of surgery	183	107	43	33
Number who had an operation	30	9	11	10
Percentage of those advised to have surgery who had an operation	16 4	8 4	25 6	30 3

A record was made of the number of persons who were advised to have surgery. Of all persons examined, 12 percent were advised to have a surgical operation In the school examinations this percentage was 16, as compared with 10 and 7 in the two other classes of examinations. Of those persons found to have defects, 36 percent were advised to have a surgical operation In the school examinations

[10] In Detroit school examinations of children from second grade through high school in 1929-30, 40 percent of the individuals were found to have defects (3).

this percentage was 41, as compared with 36 and 24 in the other two classes of examinations Of those persons advised to have surgery, 16 percent reported that they had followed the advice by having an operation In school examinations only 8 percent had taken the advice and had an operation In the other examinations of school and preschool children, 26 percent had taken such action; and in the examinations of older children and adults, 30 percent of those advised to have surgery had had an operation.

SUMMARY

Records of all medical care were obtained on 8,758 white families in 130 localities in 18 States for a period of 12 consecutive months between February 1928 and June 1931. Each family was visited at intervals of 2 to 4 months to obtain the record

The surveyed families include representation from nearly all geographic sections, from rural, urban, and metropolitan areas, from all income classes, and of both native- and foreign-born persons. The proportions of these various elements included are not identical with those included in the population of the United States, but the variations are not generally large In other respects also the surveyed group is not dissimilar to families in the general white population of the United States

It was found that 48 percent of the persons under observation had one or more calls to a physician, and 62 percent had one or more calls for medical, dental, or eye care during the year The great majority of the consultations were for illness, all health examinations amounting to only 9 per 100 persons. This represents about one tenth of the usual number considered adequate for good medical care (11). Of the 91 physical examinations per 1,000 persons, 78 were complete and the others were check-ups of a particular part of the body Chest and lung examinations constituted about half of all check-ups. Eye refractions and prenatal and post-partum check-ups are not included in this paper.

The frequency of examinations varies a great deal with age (fig. 2). The highest rates are for infants and school children, with the preschool ages only slightly below the school ages. Among adults the rates gradually rise to a maximum at 60 to 64 years, but this peak is far below the rates for children.

Examination rates are higher for females than for males at all ages under 55; above that age the reverse is true (fig. 3).

Fewer complete but more check-up examinations (exclusive of prenatal and post-partum check-ups) were reported among married than among single persons.

Physical examinations are more frequent in families with larger incomes than in those of the lower income classes. The differences are

greatest among persons over 45 years of age At the school ages little or no difference appears (fig 4)

Persons in professional occupations have more frequent examinations than skilled or unskilled laborers Merchants, business men, clerks, and salesmen fall between the two extremes (fig 5)

No consistent differences were found in the frequency of examinations in urban and rural areas

A higher proportion of persons who were sick three or more times during the year had health examinations (exclusive of care for illness) than persons who were not sick Persons sick once or twice fall between the two extremes These statements are true for specific ages and income classes (figs 6 and 7)

Of all physical examinations, 55 percent were made in public clinics In contrast, only 5 percent of all cases of illness that had an attendant were treated in public clinics Between these two extremes come immunizations (all kinds) with 42 percent in public clinics, prenatal care and post-partum examinations with 16 percent, and dental care with 7 percent in public clinics. Only 3 percent of all eye refractions were done in public clinics (fig. 8).

Considered by age, a high percentage of the examinations of children are made in public clinics (including school examinations), but among adults the greater part are made in private practice (figs. 9 and 10)

Only 3 percent of the examinations included X-ray service, and 7 percent had one or more laboratory procedures, including 5 percent with urinalyses.

In 44 percent of the examinations, defects were reported as being present. Of the persons with defects, 54 percent reported that some action was being taken to correct these conditions. Of those who had defects, 35 percent were advised to have a surgical operation, and of those so advised 16 percent reported that surgery had been done.

Finally, it may be said that at present the "annual health examination" exists more in theory than in fact. Less than 4 percent of adults had an examination of any kind during the year. If an important weapon in the control of tuberculosis, cancer, and other diseases of adult life lies in early diagnosis by periodic examination—as many health authorities believe—then it is evident that there is a wide field here for the extension of public-health activities, especially in the lower economic levels.

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COURT DECISION ON PUBLIC HEALTH

Undulant fever held compensable under workmen's compensation act.—(Idaho Supreme Court, *Crowley* v. *Idaho Industrial Training School et al.*, 26 P.(2d) 180; decided Oct. 19, 1933.) An employee of the Idaho Industrial Training School, who was classified as an instructor of dairying, was required by his duties to care for a herd of dairy cows at calving time and, after the calves were born, to treat the cows with disinfectants by inserting his hand and arm into the bodies of the animals. Some of the cows in the herd were infected with contagious abortion. The employee contracted undulant fever and sought compensation therefor under the workmen's compensation act. The supreme court affirmed a finding by the trial court that the injury

for which compensation was claimed was an accident arising out of and in the course of the employment, stating, in part, as follows:

Appellants' first assignment of error presents the question of law as to whether, under the facts and findings, the alleged injury for which respondent seeks compensation is a compensable accident arising out of and in the course of his employment, or an occupational or industrial disease or sickness not arising out of and in the course of his employment and not compensable * * * We cannot say from the record before us that there is not sufficient competent evidence to sustain the court's finding that the injury received by respondent resulted from the exposure to the disease by the method necessarily followed in treating the cows * * * Respondent's treatment of the cows, as found by the court, was an incidental duty among other numerous duties he was required to perform as a dairy instructor There is evidence that the usual source of undulant fever infection is through the human digestive tract from taking raw fat or milk, and that contracting it by coming in contact with cows carrying the germ is not prevalent nor is it a condition frequently met The evidence bears out the conclusion that the contracting of undulant fever is not inherent in the handling of cows, nor is it the customary or usual result or concomitant of the occupation and mode of work followed by respondent

* * * * * * *

If the injury sustained by respondent was not one inherent to his occupation as commonly understood, but an accident as used in the popular and ordinary sense of the word, as denoting an unlooked for mishap or untoward event which is not expected or designed, his recovery cannot be denied upon the theory that the injury resulted from an occupation disease and not from an accident We are inclined to the view that the proper rule to be applied in the case at bar is announced in the case of *Reinoehl* v *Hamacher Pole, etc., Co.*, 51 Idaho 359, 6 P. (2d) 860; *Ramsay* v *Sullivan Min. Co*, supra.

DEATHS DURING WEEK ENDED FEB. 17, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Feb 17, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	9,780	8,893
Deaths per 1,000 population, annual basis	13 6	12.4
Deaths under 1 year of age	623	640
Deaths under 1 year of age per 1,000 estimated live births	58	[1] 55
Deaths per 1,000 population, annual basis, first 7 weeks of year	12 6	12.7
Data from industrial insurance companies		
Policies in force	67,515,644	69,031,839
Number of death claims	11,810	12,767
Death claims per 1,000 policies in force, annual rate	9 1	9.6
Death claims per 1,000 policies, first 7 weeks of year, annual rate	10.7	11 5

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Feb. 24, 1934, and Feb. 25, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb 24, 1934, and Feb 25, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb 24, 1934	Week ended Feb 25, 1933	Week ended Feb 24, 1934	Week ended Feb 25, 1933	Week ended Feb 24, 1934	Week ended Feb 25, 1933	Week ended Feb 24, 1934	Week ended Feb 25, 1933
New England States								
Maine	-------	2	2	114	2	4	0	0
New Hampshire	-------	-------	1	-------	222	-------	0	0
Vermont	-------	1	-------	-------	27	1	0	0
Massachusetts	5	25	-------	10	1, 807	282	0	0
Rhode Island	1	-------	-------	2	6	1	0	0
Connecticut	2	6	6	24	30	189	0	1
Middle Atlantic States								
New York	40	50	[1] 16	[1] 45	1, 047	2, 985	6	3
New Jersey	11	15	23	38	408	935	0	1
Pennsylvania	58	61	-------	-------	2, 082	1, 143	3	3
East North Central States								
Ohio	33	33	119	228	449	625	3	0
Indiana	38	34	108	68	691	23	3	0
Illinois	34	61	33	175	968	237	7	18
Michigan	4	25	8	17	67	1, 004	2	1
Wisconsin	16	5	78	197	1, 024	393	2	1
West North Central States								
Minnesota	13	2	2	3	207	1, 135	1	1
Iowa [2]	-------	9	14	-------	86	-------	0	2
Missouri	52	29	206	20	1, 408	202	8	5
North Dakota	8	8	10	10	36	81	1	0
South Dakota	-------	3	-------	17	624	10	0	1
Nebraska	4	8	27	15	22	13	0	0
Kansas	9	9	2	9	125	222	3	0
South Atlantic States:								
Delaware	2	4	-------	-------	167	6	0	1
Maryland [2]	11	11	24	86	318	7	0	0
District of Columbia	4	5	2	5	473	2	0	0
Virginia	22	16	-------	-------	1, 131	288	5	3
West Virginia	16	13	80	40	26	446	1	0
North Carolina	25	18	77	143	3, 230	502	0	3
South Carolina	6	8	880	1, 464	529	167	0	0
Georgia [3]	14	6	206	400	1, 880	102	1	0
Florida	8	14	2	384	114	15	0	1
East South Central States:								
Kentucky	32	12	108	82	374	22	3	3
Tennessee	9	8	112	81	975	31	3	3
Alabama [2]	41	18	253	123	836	20	1	0
Mississippi [2]	10	9	-------	-------	-------	-------	0	2

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb 24, 1934, and Feb 25, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Feb 24, 1934	Week ended Feb 25, 1933	Week ended Feb 24, 1934	Week ended Feb 25, 1933	Week ended Feb 24, 1934	Week ended Feb 25, 1933	Week ended Feb 24, 1934	Week ended Feb 25, 1933
West South Central States								
Arkansas	10	10	89	70	473	88	3	0
Louisiana	22	22	11	7	128	43	0	2
Oklahoma [4]	14	17	169	154	432	23	2	3
Texas [3]	129	55	825	251	2,028	521	2	1
Mountain States								
Montana [5]	2		64	99	32	105	1	0
Idaho				5	28	92	0	0
Wyoming	1				65	3	0	0
Colorado	2	4		53	78	7	0	3
New Mexico	5	10		5	135	3	1	0
Arizona	1	4	26	3	22	17	0	1
Utah [2]		2			725	3	0	0
Pacific States								
Washington	2	3		2	200	31	2	0
Oregon [5]	6	4	62	74	55	100	0	0
California	38	39	38	114	1,154	719	2	1
Total	760	698	3,683	4,637	26,946	12,848	66	64

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb 24, 1934	Week ended Feb 25, 1933	Week ended Feb. 24, 1934	Week ended Feb 25, 1933	Week ended Feb 24, 1934	Week ended Feb 25, 1933	Week ended Feb 24 1934	Week ended Feb 25, 1933
New England States								
Maine	0	0	18	36	0	0	1	2
New Hampshire	0	0	17	51	1	0	0	0
Vermont	1	0	11	15	0	1	0	2
Massachusetts	0	0	237	371	0	0	0	0
Rhode Island	0	0	11	36	0	0	0	0
Connecticut	0	0	44	137	0	0	0	0
Middle Atlantic States								
New York	0	2	789	882	0	0	7	5
New Jersey	0	0	179	314	0	0	6	2
Pennsylvania	0	0	779	843	0	0	8	3
East North Central States								
Ohio	0	0	689	750	1	9	11	2
Indiana	0	0	248	170	1	4	2	0
Illinois	1	2	632	484	8	4	3	6
Michigan	0	1	486	530	1	3	3	3
Wisconsin	0	2	230	123	50	16	1	2
West North Central States								
Minnesota	0	0	74	89	5	0	3	3
Iowa [2]	0	0	71	62	2	37	2	1
Missouri	0	0	143	133	2	0	6	1
North Dakota	0	0	54	15	0	3	0	0
South Dakota	0	0	10	10	0	0	0	0
Nebraska	0	1	17	25	2	0	0	0
Kansas	0	0	80	65	0	0	2	1
South Atlantic States								
Delaware	0	0	13	4	0	0	0	1
Maryland [3]	0	0	73	122	0	0	1	7
District of Columbia	0	0	25	12	0	0	0	0
Virginia	0	0	44	45	1	0	6	4
West Virginia	0	0	79	31	0	0	6	7
North Carolina	1	0	46	36	0	0	0	6
South Carolina	0	1	7	3	3	0	3	1
Georgia [3]	0	0	12	9	0	0	10	1
Florida	0	0	2	7	0	0	2	4
East South Central States.								
Kentucky	1	0	96	38	0	0	6	3
Tennessee	0	1	40	47	2	0	4	2
Alabama [3]	0	0	21	10	0	14	3	3
Mississippi [2]	0	0	14	8	0	3	2	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Feb 24, 1934, and Feb 25, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Feb 24, 1934	Week ended Feb 25, 1933	Week ended Feb 24, 1934	Week ended Feb 25, 1933	Week ended Feb 24, 1934	Week ended Feb 25, 1933	Week ended Feb 24, 1934	Week ended Feb 25, 1933
West South Central States								
Arkansas	0	0	8	15	0	16	2	3
Louisiana	0	0	42	8	2	0	6	17
Oklahoma [4]	0	0	20	22	7	0	4	4
Texas [3]	2	0	142	40	44	44	18	3
Mountain States								
Montana [5]	0	0	10	19	0	0	2	4
Idaho	0	0	18	0	1	14	0	0
Wyoming	0	0	6	5	1	0	0	0
Colorado	0	0	39	39	4	0	0	0
New Mexico	1	0	24	12	0	0	0	1
Arizona	0	0	17	17	0	0	2	0
Utah [2]	0	0	9	11	1	0	0	0
Pacific States								
Washington	0	1	62	58	2	7	2	1
Oregon [5]	0	0	40	17	5	2	2	3
California	5	0	271	196	5	44	4	5
Total	12	11	5,999	5,972	151	221	140	115

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended Feb 24, 1934, 19 cases, as follows Georgia, 8, Alabama, 7, Texas, 4
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended Feb 24, 1934, 4 cases, as follows Montana, 3, Oregon, 1.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1934										
Alabama	4	137	392	75	813	8	3	104	3	33
Arizona	10	16	116		203	1	1	97	3	5
Florida	1	55	10	29	126	3	0	32	0	12
Idaho		4	4		360		0	48	16	7
Illinois	36	178	148	7	881		5	2,219	9	30
Louisiana	4	116	57	138	127	7	3	122	9	45
Maryland		56	141		265		0	407	0	11
Ohio	5	248	266	1	2,471		5	2,549	3	27
Pennsylvania	14	353		1	5,114	3	4	3,097	0	51
Rhode Island		16	2		13		0	104	0	2
Washington	4	10	89		2,257	1	11	188	18	8

January 1934

	Cases
Chicken pox	
Alabama	189
Arizona	86
Florida	138
Idaho	40
Illinois	2,332
Louisiana	129
Maryland	675
Ohio	2,897
Pennsylvania	5,753
Rhode Island	135
Washington	539
Diarrhea	
Maryland	12
Diarrhea and enteritis	
Ohio (under 2 years)	37
Dysentery	
Alabama (amoebic)	2
Arizona	5
Florida	1
Illinois (amoebic)	80
Illinois (amoebic carriers)	420
Illinois (bacillary)	7
Louisiana	8
Maryland	6
Ohio	17
Pennsylvania	12
Washington (amoebic)	7
Food poisoning	
Ohio	22
German measles	
Arizona	50
Illinois	41
Maryland	19
Ohio	703
Pennsylvania	142
Rhode Island	3
Washington	7
Hookworm disease	
Louisiana	13
Maryland	1
Impetigo contagiosa	
Maryland	48
Washington	2
Lead poisoning	
Illinois	4
Leprosy	
Illinois	1

January 1934—Continued

	Cases
Lethargic encephalitis	
Alabama	3
Illinois	7
Ohio	4
Pennsylvania	6
Washington	5
Mumps	
Alabama	32
Arizona	14
Florida	32
Idaho	1
Illinois	876
Louisiana	4
Maryland	151
Ohio	324
Pennsylvania	1,730
Rhode Island	5
Washington	508
Ophthalmia neonatorum	
Alabama	1
Illinois	10
Maryland	3
Ohio	59
Pennsylvania	13
Washington	1
Paratyphoid fever	
Illinois	1
Ohio	3
Washington	1
Puerperal septicemia	
Illinois	8
Ohio	2
Rabies in animals	
Alabama	102
Illinois	26
Louisiana	15
Washington	5
Rabies in man	
Illinois	1
Pennsylvania	1
Scabies	
Maryland	3
Septic sore throat	
Illinois	20
Louisiana	1
Maryland	20
Ohio	285
Rhode Island	2
Washington	2

January 1934—Continued

	Cases
Tetanus	
Alabama	7
Illinois	2
Louisiana	2
Maryland	2
Ohio	1
Trachoma	
Alabama	2
Arizona	75
Illinois	2
Ohio	1
Washington	1
Trichinosis	
Illinois	3
Maryland	1
Tularaemia	
Florida	1
Illinois	26
Louisiana	9
Maryland	4
Ohio	7
Typhus fever	
Alabama	27
Florida	3
Illinois	1
Undulant fever	
Alabama	2
Arizona	1
Illinois	2
Louisiana	9
Maryland	3
Ohio	5
Pennsylvania	5
Rhode Island	1
Washington	6
Vincent's infection	
Illinois	50
Maryland	9
Whooping cough	
Alabama	226
Arizona	86
Florida	70
Idaho	7
Illinois	1,449
Louisiana	20
Maryland	577
Ohio	1,690
Pennsylvania	2,565
Rhode Island	102
Washington	585

EPIDEMIC OF CEREBROSPINAL MENINGITIS IN THE ARKANSAS STATE PENITENTIARY

An epidemic of cerebrospinal meningitis occurred in the Arkansas State Penitentiary from December 8, 1933, to January 11, 1934. Four cases, with 3 deaths, and 1 suspected fatal case occurred in Camp No 1 from December 8, 1933, to January 9, 1934, and 7 cases with 5 deaths occurred in Camp No. 2 from December 25, 1933, to January 11, 1934.

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb 17, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	4	3	0	3	0	9	30
New Hampshire											
Concord	0	------	0	30	1	2	0	1	0	0	15
Manchester	0	------	0	36	1	5	0	0	0	0	7
Nashua	0	------	0	1	0	2	0	0	0	0	--------
Vermont											
Barre	0	------	0	0	0	0	0	0	0	0	1
Burlington	1	------	0	0	0	1	0	1	1	16	6
Massachusetts											
Boston	2	------	4	364	41	72	0	11	0	63	285
Fall River	0	------	3	0	5	2	0	1	0	5	29
Springfield	1	------	0	3	1	4	0	1	1	8	42
Worcester	0	------	1	51	9	9	0	3	0	7	67
Rhode Island											
Pawtucket	3	------	0	0	0	0	0	0	0	0	0
Providence	1	------	1	1	12	7	0	1	0	24	79
Connecticut:											
Bridgeport	0	------	1	6	2	16	0	2	0	1	35
Hartford	0	------	0	0	8	8	0	1	0	3	52
New Haven	0	------	0	1	5	1	0	0	0	3	49
New York											
Buffalo	1	------	1	214	23	33	0	8	0	20	161
New York	36	23	15	40	205	259	0	119	1	68	1,837
Rochester	2	------	0	1	1	41	0	1	0	5	90
Syracuse	0	------	0	0	5	5	0	1	0	32	52
New Jersey											
Camden	2	1	1	73	9	18	0	0	0	4	39
Newark	0	8	0	6	12	23	0	8	0	16	128
Trenton	0	1	1	27	5	11	0	4	0	1	55
Pennsylvania											
Philadelphia	4	------	0	1,189	57	121	0	36	2	33	593
Pittsburgh	5	9	8	19	23	35	0	17	1	34	221
Reading	2	------	1	4	6	2	0	0	0	3	34
Ohio											
Cincinnati	4	------	2	358	21	27	0	6	0	19	160
Cleveland	5	49	4	13	24	89	0	12	0	82	242
Columbus	5	3	3	11	8	48	0	5	0	21	110
Toledo	0	1	1	77	9	44	0	6	0	60	91
Indiana											
Fort Wayne	7	------	0	6	1	13	0	0	1	2	34
Indianapolis	2	------	0	136	23	13	0	7	1	38	--------
South Bend	1	------	2	2	1	9	0	1	1	0	19
Terre Haute	0	------	0	34	1	1	0	0	0	2	24
Illinois:											
Chicago	1	7	2	36	62	264	0	46	1	167	715
Cicero	0	------	0	0	0	0	0	0	0	0	8
Springfield	1	2	0	71	5	2	0	1	0	3	26
Michigan:											
Detroit	4	8	4	9	25	135	0	18	0	102	318
Flint	0	------	0	6	6	70	0	1	0	11	34
Grand Rapids	0	------	0	3	2	14	0	0	1	4	35
Wisconsin.											
Kenosha	1	------	0	1	0	27	0	0	0	5	7
Madison	0	------	--------	1	-------	10	0	0	0	40	10
Milwaukee	2	1	1	0	3	74	0	3	0	81	97
Racine	0	------	0	0	1	10	0	0	0	11	17
Superior	0	------	0	0	0	0	0	0	0	1	9
Minnesota.											
Duluth	0	------	0	2	3	1	0	2	0	1	20
Minneapolis	3	------	1	6	10	23	0	2	0	28	92
St. Paul	1	------	0	0	8	4	1	3	0	3	56
Iowa:											
Des Moines	0	------	--------	0	-------	15	1	-------	0	0	30
Sioux City	0	------	--------	16	-------	0	0	-------	0	0	--------
Waterloo	0	------	--------	0	-------	0	0	-------	0	6	--------
Missouri:											
Kansas City	5	------	1	1	32	31	0	6	0	7	140
St. Joseph	1	------	0	0	6	0	0	0	0	0	32
St. Louis	20	3	1	807	11	20	0	7	0	68	214

City reports for week ended Feb. 17, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Dakota											
Fargo	1	------	1	95	2	0	0	1	0	5	14
Grand Forks	0	------	0	0	0	0	0	0	0	0	------
South Dakota											
Aberdeen	0	------	0	2	0	0	0	0	0	0	------
Sioux Falls	0	------	0	14	0	0	0	0	0	0	7
Nebraska											
Omaha	0	------	0	87	11	3	0	2	0	12	69
Kansas											
Topeka	0	------	0	1	1	4	0	0	1	14	16
Wichita	3	------	0	0	7	7	0	1	0	5	36
Delaware											
Wilmington	0	------	0	43	10	2	0	4	0	6	42
Maryland											
Baltimore	2	7	1	252	24	44	0	15	1	159	259
Cumberland	0	------	0	0	1	4	0	0	0	2	18
Frederick	------	------	------	------	------	------	------	------	------	------	------
District of Columbia											
Washington	5	5	2	413	14	14	0	15	0	20	109
Virginia											
Lynchburg	2	------	0	0	3	1	0	0	0	1	13
Norfolk	1	2	0	50	2	8	0	0	0	1	28
Richmond	0	------	1	2	12	6	0	1	1	2	77
Roanoke	1	------	3	0	2	2	0	0	0	1	24
West Virginia											
Charleston	0	------	0	0	2	1	0	0	0	0	10
Huntington	0	------	0	0	0	2	0	0	0	0	------
Wheeling	0	------	0	2	6	14	0	1	0	12	27
North Carolina											
Raleigh	------	------	------	------	------	------	------	------	------	------	------
Wilmington	0	------	0	2	2	0	0	0	0	6	15
Winston-Salem	1	------	0	172	1	4	0	2	0	0	21
South Carolina											
Charleston	0	24	2	35	1	0	0	1	0	1	24
Columbia	------	------	------	------	------	------	------	------	------	------	------
Greenville	0	------	0	0	1	2	0	0	0	2	7
Georgia											
Atlanta	10	42	6	265	11	5	0	5	1	3	104
Brunswick	0	------	0	182	0	0	0	0	1	0	4
Savannah	0	88	1	81	6	1	0	3	0	0	53
Florida											
Miami	0	1	0	0	6	0	0	0	0	3	40
Tampa	3	------	0	0	4	0	0	0	0	0	21
Kentucky											
Ashland	0	------	------	0	------	0	0	------	0	0	------
Lexington	1	------	0	2	6	0	0	0	0	2	21
Louisville	3	4	1	5	23	31	0	2	0	39	140
Tennessee											
Memphis	2	------	7	356	14	12	0	5	0	2	101
Nashville	0	------	3	149	7	10	0	5	0	0	75
Alabama											
Birmingham	1	12	5	24	15	4	0	5	0	10	86
Mobile	1	------	1	3	4	0	1	1	0	0	36
Montgomery	0	------	------	9	------	2	0	------	0	2	------
Arkansas											
Fort Smith	1	------	------	89	------	1	0	------	0	0	------
Little Rock	0	------	0	87	3	0	0	2	0	0	5
Louisiana											
New Orleans	13	6	5	23	12	10	0	8	2	2	173
Shreveport	0	------	0	7	11	5	0	3	0	0	40
Oklahoma											
Tulsa	3	------	------	49	------	2	0	------	0	3	------
Texas:											
Dallas	8	2	2	0	15	9	0	3	3	4	79
Fort Worth	4	------	0	1	8	3	0	1	0	3	39
Galveston	4	------	0	0	2	5	0	0	0	0	16
Houston	4	------	1	6	7	5	3	8	0	0	80
San Antonio	3	------	4	9	11	13	0	10	1	0	71
Montana											
Billings	0	------	0	0	0	2	0	0	0	3	9
Great Falls	0	------	0	1	1	0	0	0	0	1	5
Helena	0	------	0	1	0	0	0	0	0	0	3
Missoula	0	------	0	0	0	0	0	0	0	0	0

City reports for week ended Feb 17, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Idaho											
Boise	0	------	0	0	1	1	0	0	0	0	5
Colorado											
Denver	1	------	2	14	4	20	0	3	0	112	88
Pueblo	0	------	0	0	5	1	0	0	0	6	11
New Mexico											
Albuquerque	0	------	0	4	0	3	0	1	0	0	6
Utah											
Salt Lake City	0	------	1	515	4	7	2	0	0	12	40
Nevada											
Reno	0	------	0	1	0	0	0	1	0	0	3
Washington											
Seattle	0	------	2	0	1	14	2	3	1	57	94
Spokane	0	------	------	185	1	1	1	------	0	13	27
Tacoma	0	------	0	17	5	1	0	1	0	10	27
Oregon											
Portland	0	1	1	4	4	12	0	1	0	1	87
Salem	0	3	0	0	0	0	0	0	0	7	------
California											
Los Angeles	22	20	0	42	22	60	1	29	1	62	336
Sacramento	0	2	0	3	3	5	0	2	2	8	28
San Francisco	7	7	2	40	8	13	0	13	0	35	159

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts			
Boston	1	0	0
New York			
New York	3	4	0
New Jersey			
Newark	1	0	0
Pennsylvania			
Pittsburgh	0	1	0
Ohio			
Cleveland	1	0	0
Toledo	0	1	0
Illinois			
Chicago	5	1	0
Michigan			
Detroit	1	0	0
Wisconsin			
Madison	[1] 1	0	0
Minnesota			
Minneapolis	1	0	0

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Missouri			
Kansas City	0	1	0
St Joseph	0	1	0
St Louis	1	2	0
District of Columbia			
Washington	0	0	1
Georgia			
Atlanta	1	0	0
Tennessee			
Memphis	1	0	0
Louisiana			
New Orleans	1	0	0
Washington			
Spokane	1	0	0
California			
Los Angeles	2	2	2

[1] Nonresident

Pellagra—Cases: Atlanta, 1, New Orleans, 2, Dallas, 1
Lethargic encephalitis—Cases. New York, 1, Kansas City 1
Typhus fever—Baltimore, 1 case, 1 death.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended February 10, 1934.—During the 2 weeks ended February 10, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows·

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				1	2	1			2	6
Chicken pox		3		224	488	86	61	21	69	952
Diphtheria		6	3	28	19	14	3	1		74
Dysentery				1						1
Erysipelas				8	5	5	1	1	4	24
Influenza		4		1	16	2			28	51
Lethargic encephalitis					1					1
Measles		1	4	230	26	249	1,139	1	8	1,658
Mumps					193	7	5		176	381
Paratyphoid fever						1				1
Pneumonia		4			31		1		18	54
Poliomyelitis					1				1	2
Scarlet ever	1	5	7	121	258	57	23	24	218	714
Trachoma									11	11
Tuberculosis	1	1	8	139	97	17	40	7	31	341
Typhoid fever			2	40	12		1			55
Undulant fever				1	3	3				7
Whooping cough		37		312	152	26	41	9	34	611

Ontario Province—Communicable diseases—4 weeks ended January 27, 1934—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 4 weeks ended January 27, 1934, as follows

Disease	Cases	Deaths	Disease	Cases	Deaths
Actinomycosis	1		Pneumonia		177
Chancroid	3		Poliomyelitis	1	
Chicken pox	1,184		Scarlet fever	565	5
Diphtheria	29	4	Septic sore throat	2	
Erysipelas	15		Smallpox	1	
German measles	12		Syphilis	199	
Gonorrhea	228		Trench mouth	1	
Influenza	30	7	Tuberculosis	126	34
Lethargic encephalitis		1	Typhoid fever	28	
Measles	208		Undulant fever	6	
Mumps	437		Whooping cough	303	
Paratyphoid fever	1				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE — A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Feb 23, 1934, pp 276–288 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Mar 30, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands —During the week ended February 24, 1934, cholera was reported in the Philippine Islands as follows Bohol Province—Balilihan, 1 case, 1 death; Calape, 6 cases, 4 deaths, Carmen, 5 cases, 5 deaths, Clarin, 33 cases, 21 deaths; Cortes, 1 death; Inabanga, 19 cases, 8 deaths, Loon, 7 cases, 2 deaths, Tagbilaran, 3 cases, 2 deaths, Talibon, 3 cases, 2 deaths; Tubigon, 18 cases, 15 deaths, Occidental Misamis Province—Jimenez, 1 case; Occidental Negros Province—Calatraba, 1 case, 1 death; Oriental Negros Province—Ayuquitan, 3 cases, 3 deaths

Siam—Bangkok —During the week ended February 24, 1934, 1 case of cholera was reported in Bangkok, Siam.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 11

MARCH 16 - - - - 1934

IN THIS ISSUE

Summary of Current Prevalence of Communicable Diseases
Some Facts and Limitations in Amoebic Dysentery Control
Brief Report on Experimental Studies of Rheumatic Fever
Susceptibility of Mice to Rocky Mountain Spotted Fever
Deaths in Large Cities During the Week Ended February 24
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D C. - - - - - - Price, 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93, title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

Requests for and communications regarding the PUBLIC HEALTH REPORTS, reprints, or supplements should be addressed to the Surgeon General, United States Public Health Service, Washington, D C Subscribers should remit direct to the Superintendent of Documents, Washington, D C.

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CONTENTS

	Page
Current prevalence of communicable diseases in the United States—January 28–February 24, 1934	357
Control of amoebic dysentery	359
Notes on experimental rheumatic fever	361
Rocky Mountain spotted fever—The susceptibility of mice	363
Methylene blue in the treatment of HCN gas poisoning—A correction	367
Court decision on public health	367
Deaths during week ended February 24, 1934:	
Deaths and death rates for a group of large cities in the United States	369
Death claims reported by insurance companies	369

PREVALENCE OF DISEASE

United States:	
Current weekly State reports:	
Reports for weeks ended March 3, 1934, and March 4, 1933	370
Summary of monthly reports from States	372
Weekly reports from cities:	
City reports for week ended February 24, 1934	373
Foreign and insular:	
Canada—Quebec Province—Communicable diseases—2 weeks ended February 24, 1934	376
Cuba—Habana—Communicable diseases—4 weeks ended February 24, 1934	376
Czechoslovakia—Communicable diseases—December 1933	376
Italy—Communicable diseases—4 weeks ended September 17, 1933	377
Jamaica—Communicable diseases—4 weeks ended February 24, 1934	377
Puerto Rico—Notifiable diseases—4 weeks ended February 24, 1934	377
Cholera, plague, smallpox, typhus fever, and yellow fever:	
Cholera	378
Plague	378
Smallpox	378

PUBLIC HEALTH REPORTS

VOL. 49 MARCH 16, 1934 No. 11

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

January 28–February 24, 1934

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Measles.—The incidence of measles was considerably above the usual seasonal expectancy. For the 4 weeks ended February 24 there were 94,984 cases reported, approximately 44,000 more than were reported for the preceding 4 weeks. Compared with recent years the number was more than twice that recorded for this period in each of the 6 years for which data are available. The current incidence reached the level of 1926, when measles was exceptionally prevalent. The peak incidence in that year, however, was not reached until the usual time of the highest incidence of measles, in May.

Measles reports for the country as a whole represent an average of so many localities whose epidemic peaks vary in time that the total cases do not differ greatly from year to year. However, there appear to be occasional years of exceptionally high incidence, such as 1926 and the present year.

Each geographic area reported a very significant increase over the preceding 4 weeks, and the increases over last year ranged from 19 percent in the New England and Middle Atlantic States to six times last year's figure in the South Central groups. In the West North Central, South Atlantic, South Central, and Mountain and Pacific areas the incidence was the highest since 1926. The number of cases (20,847) in the New England and Middle Atlantic States was slightly higher than that for the corresponding period last year; but it was approximately 3,000 cases below the number in 1932, when the disease was unusually prevalent in those regions. In the East North Central area the incidence was considerably above that for 1932 and 1933.

[1] From the Office of Statistical Investigations, U S Public Health Service The numbers of States included for the various diseases are as follows. Typhoid fever, 48; poliomyelitis, 48; meningococcus meningitis, 48, smallpox, 48; measles, 47, diphtheria, 48, scarlet fever, 48, influenza, 43 States and New York City. The District of Columbia is counted as a State in these reports These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers.

Influenza —For the 4 weeks ended February 24 the reported number of cases of influenza was 13,041, approximately 4,000 more than were reported for the preceding 4-week period The current incidence closely approached that for the corresponding period in 1930, when the number of cases was 10,627 During this period in 1933 the 1932-33 epidemic was rapidly declining and the number of cases had dropped from 157,860, at the peak of the epidemic in December 1932, to 26,557. In 1932 a sharp rise in influenza occurred during this period and 25,207 cases were reported. For this period in 1931, when a minor epidemic prevailed, 41,548 cases were reported In the South Central area, except for Texas, where there was some rise in the number of cases reported, the incidence of the disease continued practically on a level with that of last year, but all other areas reported significant decreases

Smallpox.—The incidence of smallpox rose about 50 percent during the current 4 weeks as compared with the preceding 4-week period. All regions contributed to this expected seasonal increase. The number of cases reported (607), however, was the lowest for the corresponding period in recent years. In 1933, 1932, and 1931 the numbers of cases for this period were 748, 1,402, and 4,137, respectively. A slight increase over last year's figure was reported from the East North Central and South Atlantic areas, but all others reported decreases ranging from 7 percent in the South Central areas to 55 percent in the Mountain and Pacific areas.

Meningococcus meningitis.—The number of cases of meningococcus meningitis continued to be the lowest in recent years. For the 4 weeks ended February 24 the cases numbered 227, as compared with 307, 327, and 588 for the corresponding period in 1933, 1932, and 1931, respectively The low incidence was very general The Mountain area reported a slight increase over last year, but the incidence was still considerably below that of former years.

Poliomyelitis —The incidence of poliomyelitis showed the expected seasonal decline during the current 4-week period, but the number of cases (66) represented an increase of approximately 30 percent over last year's figure for the corresponding period. For this period in 1932, 1931, and 1930 the numbers of cases were 130, 96, and 79, respectively. The Pacific area seemed mostly responsible for the increase over last year, 22 cases being reported there, as compared with 4 last year. California reported 20 of the 22 cases. The South Central area reported a 50 percent decrease, while other areas closely approximated last year's incidence.

Diphtheria.—There were 3,388 cases of diphtheria reported for the current 4-week period. In 1933, 1932, and 1931 the numbers of cases for this period were 3,187, 5,139, and 4,540, respectively. The South Atlantic area reported a 25 percent increase over last year's figure, and

in the South Central section the incidence was 1 7 times that of last year Other areas closely approximated last year's incidence.

Scarlet fever.—For the country as a whole the number of cases of scarlet fever reported for the current 4-week period was 24,249, which was the highest incidence for this period in the 6 years for which data are available Very appreciable increases over last year were reported from all sections of the country except the New England and Middle Atlantic In the New England section the current incidence was practically on a level with that of last year, while a 10-percent decrease was reported from the Middle Atlantic area

Typhoid fever.—For the 4 weeks ended February 24 the number of cases of typhoid fever was 619, as compared with 481, 794, and 580 for the corresponding period in the years 1933, 1932, and 1931, respectively While the current incidence was about 30 percent in excess of that for this period last year, it compared very favorably with the average for recent years. The Middle Atlantic and West South Central areas seemed mostly responsible for the increase over last year. In the Middle Atlantic area 83 cases were reported for the current period as against 57 last year, and the West South Central area reported 153 as against 76 last year. In other areas the incidence differed but slightly from last year.

Mortality, all causes.—The average mortality rate for all causes in large cities for the 4 weeks ended February 24, as reported by the Bureau of the Census, was 12 7 per 1,000 inhabitants (annual basis). The rates for this period in 1933, 1932, and 1931 were 12.2, 12.3, and 14.2, respectively. The high rate in 1931 was due to a minor influenza epidemic which was in progress in this period.

CONTROL OF AMOEBIC DYSENTERY

By G W. McCoy, *Medical Director, United States Public Health Service*

The outbreak of amoebic dysentery in 1933, which centered at Chicago, emphasized the fact, well known to special students of the problem of amoebiasis, that we do not have sufficient information as to the factors governing the transmission of this disease to enable us to take precisely directed and fully effective measures for its suppression.

The facts at present at the disposal of health officers do not afford sufficient basis for some of the drastic measures which are being put into execution. Perhaps, all things considered, it would not be a disadvantage from the administrative point of view to revert to the state of affairs that existed prior to the Chicago epidemic.

The following statement of facts may aid health authorities in formulating any control measures that may be considered necessary.

There appears to be very little evidence that clinical cases originating in Chicago have led to any considerable spread of the infection in the communities to which the infected individuals have gone

Carriers of the *Endamoeba histolytica* do not appear to be so much of a menace as they were thought to be; indeed, there is no clear evidence that carriers, even among food handlers, are an important source of infection

Control of the spread of the infection by the detection of carriers and their exclusion from food-handling groups does not appear to be practicable on a large scale.

There is no need for isolation of the clinical cases of amoebic dysentery beyond such isolation as may be necessary for the benefit of the patient. There is no need for the isolation of carriers

When sanitary disposal of feces is practiced, no special precautions need be taken with stools; but where facilities for such disposal are not available, precautions should be taken to prevent contamination of water supplies and the possibility of fly contamination.

No particular attention need be paid to contacts of either clinical cases or carriers

The measures that health officers may take with advantage in the present state of our knowledge would appear to be as follows·

Call the attention of physicians to the importance of recognizing and reporting cases of dysentery.

Require the reporting of all cases of dysentery, distinguishing between the amoebic and the bacillary types and those of undetermined nature.

Provide facilities for the aid of physicians in making diagnoses.

Inaugurate educational measures among all food handlers to the end that members of this group may become cognizant of the necessity for personal cleanliness, particularly in respect to the washing of the hands after defecation.

Require laboratory examination of feces of food handlers in investigations to determine the source of infection, in order that the significance of this possible source of infection may be ascertained.

Require the elimination of all possible contamination of drinking water supplies by cross connections and similar sources. This applies especially to hotels and public eating places.

It is hoped that the research now being conducted by the Public Health Service and other agencies may lead to a better understanding of many of the now obscure features of amoebic dysentery.

NOTES ON EXPERIMENTAL RHEUMATIC FEVER [1]

By A. M Stimson, *Medical Director*, O. F Hedley, *Passed Assistant Surgeon*, and Edythe Rose, *Associate Bacteriologist, United States Public Health Service*

Epidemiological studies and surveys of rheumatic fever, including those conducted thus far by this Office, while still incomplete and unsatisfactory in many particulars, have nevertheless been in essential agreement on certain features of the disease. Bacteriological studies also, while presenting some difficult points of disagreement, have increasingly tended to implicate one or more forms of streptococci in the etiology.

On the basis of the data from these two sources it is possible to construct a working hypothesis as a guide to experimental work. As such a basis we have assumed, then, that rheumatic fever is a disease of temperate climates and more prevalent in their colder sections; that it has a well-marked seasonal prevalence on this continent during the late winter and early spring months; that it prevails to a disproportionate degree among the poorer classes, to which we must add the qualifying phrase "living at home", because our observations tend to confirm those of others that children removed from poor home environments and placed under good institutional care rarely have rheumatic fever; that it is more common in cities than in the country; that the age of first attacks is during childhood after the ages of 4 or 5; and that streptococci play an important, if not essential, etiological role.

That streptococci alone could explain all of the features in the above assumptions appeared unlikely. The evidences of selection appeared to indicate a contributory predisposition. It seemed to us that nutritional differences might explain this predisposition. On the resultant hypothesis we planned animal experiments in which inoculation with streptococci would be done after preparation by dietary deficiency. In a considerable series of puppies in which induced vitamin A deficiency was followed by inoculation with streptococci derived from cases of rheumatic fever, the results were negative. It was then planned to proceed with the other known vitamin deficiencies, using suitable animal species.

At this time Rinehart and Mettier (1) reported the production of lesions resembling those of human rheumatic carditis in the hearts of guinea pigs in which scurvy had been induced; and hemolytic streptococci derived from spontaneous lymphadentis in the same species had been inoculated intracutaneously.

Our own attempts to reproduce such lesions were for a long time unsuccessful. Only recently have we been able, and in only a few

[1] From the Office of Heart Disease Investigations, U.S. Public Health Service.

animals, to produce valvular lesions (figs 1 and 2) similar to those found in some of Dr Rinehart's slides, which he kindly furnished us. The most plausible explanation for these failures which we were able to assume was that the cultures which we used, although similar in source and description, were in some way lacking in this specific pathogenicity

The purpose of this paper is to report a finding which may explain our failures and throw additional light on the nature of the lesions in question It has been found possible to produce lesions (figs 3 and 4) similar to the myocardial lesions described by Dr. Rinehart, in scorbutic guinea pigs by the injection of streptococcus exotoxin, without the introduction of living organisms It would seem, therefore, that the ability of an organism to produce such lesions may be dependent upon its toxin production

Seven guinea pigs were placed on vitamin C deficient diet, and 21 days later were injected intracardially with a streptococcic toxin of high potency for rabbits but apparently of little or no toxicity for normal guinea pigs This toxin was prepared from streptococci of scarlet fever origin The 7 pigs died in from 1 to 11 days after injection In 2 of these animals (1 dying after 5 and the other after 6 days) lesions of the myocardium were found on microsection which correspond to the most significant lesions which we have observed in Dr. Rinehart's slides In 2 more pigs similar, but less extensive and complete, lesions were found. The hearts of the 3 remaining animals failed to show lesions in the sections examined. The valves appeared not to be involved in this series.

It is not intended in this article to discuss the significance of the lesions produced by Dr. Rinehart and reproduced by us, further than to say that they give a sufficiently similar picture to that of some stages of human rheumatic heart lesions to justify, in our opinion, much further study along these lines.

The following description of the lesions is furnished by Surg. R. D. Lillie, in charge of the section of pathology of the National Institute of Health:

"In the cross section through the midportion of the ventricles several focal lesions are seen, 3 in the wall of the left ventricle, 1 in the right, and 1 in the septum. In all of these there is a proliferative reaction composed of small and medium sized fibroblasts and small giant cells with megakaryocytoid nuclei, generally loosely packed, replacing muscle fibers and infiltrating perivascular spaces. At the margin of one is a compact, rounded mass of nuclear debris resembling a necrotic cellular thrombus. Another large focus contains centrally some hyalinized, coagulated and necrotic muscle fibers. Sometimes a few lymphocytes occur in the peripheral parts of some of the lesions. Most of these foci are close to the endocardial surface; one is deep."

ɜURE 1 —Lesion in the mitral valve of guinea pig in which scurvy had been induced and a culture of streptococci from spontaneous guinea-pig lymphadenitis injected intracutaneously Low power

FIGURE 2 —Same as fig 1 High power

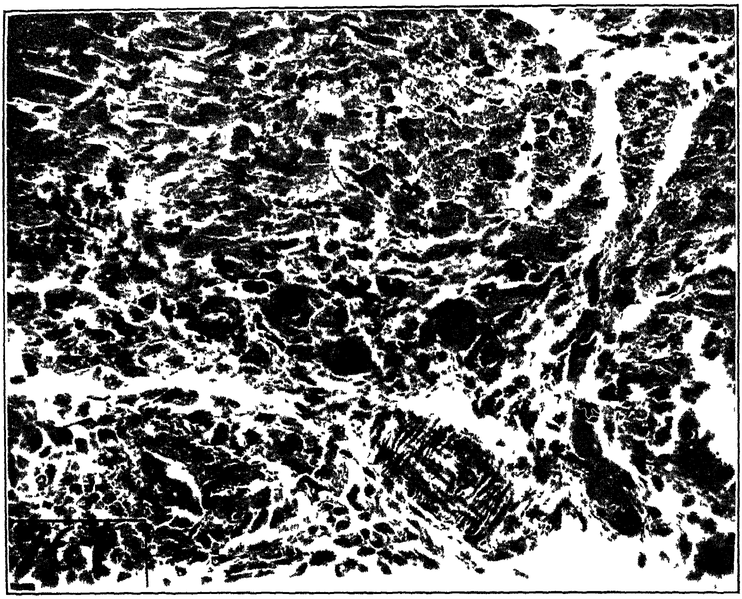

FIGURE 3 —Myocardial lesion in a guinea pig in which scurvy had been induced and an intracardial injection of scarlatina streptococcus toxin made Death occurred 6 days after injection High power

FIGURE 4 —Another lesion from the same heart as that shown in fig 3

REFERENCE

(1) Papers presented at the meeting of the American Association of Pathologists and Bacteriologists, May 9 and 10, 1933, by James F Rinehart, M D., and Stacy R Mettier, M D A The heart valves in experimental scurvy and scurvy with superimposed infection B The joints in experimental scurvy and scurvy with superimposed infection With a consideration of the possible relation of scurvy to rheumatic fever

ROCKY MOUNTAIN SPOTTED FEVER

THE SUSCEPTIBILITY OF MICE [1]

By WILLIAM L JELLISON, *Assistant Bacteriologist, United States Public Health Service*

The opinion has been generally held that the small mammalian hosts of larval and nymphal *Dermacentor andersoni*, which are susceptible to Rocky Mountain spotted fever, serve as a means for the transfer of spotted fever virus from infected to noninfected ticks and that they are, therefore, an important factor in the maintenance of the virus in nature. The number of species of susceptible host animals potentially concerned is large, since representative species of such large groups of rodents and carnivores as the chipmunks, ground squirrels, tree squirrels, cottontail, jack and snowshoe rabbits, marmots, woodrats, and weasels have been proved susceptible in varying degrees by the work of Ricketts, McClintic, Rucker, and Parker. Tick-to-tick transfer of the virus through a number of species proved susceptible also has been demonstrated, and there is no logical reason to suppose that this process does not occur in nature. Since these smaller wild animals, when infected, seldom exhibit diagnostic gross lesions or reliable febrile reactions and seldom die, their susceptibility is usually determined by transfering blood or emulsified tissue from the experimental animals to normal male guinea pigs.

The present paper concerns the susceptibility of mice, which, as a group, have heretofore been thought not susceptible. Negative results with deer mice, *Peromyscus maniculatus artemisiae*, and meadow mice, *Microtus pennsylvanicus modestus*, were recorded by Rucker (1912), but no experimental data were submitted. Fricks (1916) states that white mice are apparently immune. Wolbach (1919) states that mice are not susceptible, but does not mention what species he tested.

Dr. Parker's earlier observations, in both eastern and western Montana, have shown that mice are of greater importance as larval and nymphal hosts of *D. andersoni* than had been supposed. It has

[1] Contribution from the Rocky Mountain Spotted Fever Laboratory of the U S Public Health Service Hamilton, Mont.

been deemed desirable, therefore, to determine definitely the susceptibility of representative species of various groups of mice to Rocky Mountain spotted fever infection and to demonstrate whether or not these rodents can serve as avenues for tick-to-tick transfer of the virus.

MEADOW MICE

Susceptibility of meadow mice to spotted fever blood virus.—On March 20, 1933, 11 meadow mice, *Microtus pennsylvanicus modestus*, captured near Victor, Mont., were each injected intraperitoneally with 0.1 cc of guinea-pig passage blood virus 274. Two normal mice of the same lot were saved as controls. These mice were numbered 20 to 32, inclusively. No attempt was made to record their temperatures. One mouse was sacrificed each day from the fourth to tenth day, except on those days that 1 or more were found dead, and the 3 remaining mice were sacrified on the eleventh day. At necropsy each mouse was tested for infective virus by making spleen emulsion transfers intraperitoneally to two male guinea pigs. In one instance testicular emulsions were also used. The results of these transfers were judged by temperature records, scrotal lesions (swelling, reddening, and necrosis), and necropsy findings.

Mouse 23 died on the seventh day and mice 24 and 25 died on the eighth day following the blood virus injections. Mice 23 and 25 were females and showed no gross lesions other than splenic enlargement. Mouse 24, an adult male, exhibited marked swelling and discoloration of the scrotum, an enlarged spleen, and adherence of the visceral and parietal laminae of the tunica vaginalis. Mouse 25, which was moribund when killed and which was necropsied on the eighth day, showed similar lesions.

Definite and fatal spotted fever resulted in at least 1 of the 2 transfer guinea pigs from each of the 11 mice. Transfers from the 3 mice killed and autopsied on the eleventh day gave typical and fatal infection in 4 of the 6 test guinea pigs; the 2 other guinea pigs died without diagnostic lesions. Of the 22 test guinea pigs, 18 showed definite spotted fever, from which only 1 recovered. The remaining 4 guinea pigs all died of intercurrent infection, 2 of them representing transfers from mouse 24, which was found dead on the eighth day with advanced post-mortem changes in spleen and liver. Transfers of this material resulted in peritonitis, but testicular emulsions from the same mouse produced definite spotted fever in two transfer guinea pigs.

The course of infection in transfer guinea pigs was characterized by brief prefebrile or incubation periods and high febrile courses terminating in death. Nine guinea pigs, 49506 to 49514, inclusive, receiving 0.25 cc of guinea-pig passage virus 274, which was the source of inoculum for the mice, died of typical spotted fever.

Two other series of tests with meadow mice have been made, one in 1929 and the other in 1933 The results were comparable to those of the series cited, but fewer tests were made In one series, infection was demonstrated in a single test specimen of *M nanus*

Tick-to-tick transfer of spotted-fever virus through meadow mice and their susceptibility to tick virus —In order to demonstrate tick-to-tick transfer of the virus through meadow mice a series of three normal mice (88, 89, and 90) were infested with spotted-fever-infected nymphs and normal larvae of *D andersoni*

The three tests were comparable except with respect to the interval between the infestation of the host mice with infected and noninfected ticks For number 88 this was 2 days; for 89, 1 day; and 90 was infested with both at the same time Host 88 was sacrificed on the fourteenth day, and a spleen transfer to normal male guinea pig 54006 caused definite, fatal spotted fever Ten engorged larvae from this host were macerated and injected intraperitoneally into guinea pigs 54014 and 54015 Guinea pig 54014 showed no definite reaction, and the subsequent immunity test with blood virus was negative Guinea pig 54015 developed definite and fatal spotted fever, with typical gross lesions.

Mouse 89 was moribund on the eleventh day and was killed and autopsied A spleen tissue transfer to guinea pig 53981 resulted in a nonfatal spotted fever infection. Ten engorged larvae from this host were macerated and injected intraperitoneally into guinea pigs 54016 and 54017; both showed typical infections and one died. Death of mouse 90 occurred on the eleventh day; but owing to marked post-mortem changes, tissue transfers were not made. Ten engorged larvae from this host when macerated and injected into guinea pigs 54018 and 54019 gave negative results.

Serial passage of spotted-fever virus through meadow mice without loss of virulence.—Spotted-fever virus was passed successfully by serial transfer through four pairs of meadow mice, the series being terminated voluntarily. The first pair were each injected with guinea-pig blood passage virus. One was sacrificed on the seventh day and transfers were made to two others by injection of macerated spleen tissue Subsequent transfers were made after the same interval and in the same manner The spleen tissue from the sacrificed mouse of the second pair and from 1 mouse of the fourth pair was used in both instances for the injection of 2 control guinea pigs. All four of these controls died of typical spotted-fever infections, and no diminution of virulence was evident

In another experiment 2 different strains of virus were passed through meadow mice and then through 3 pairs of guinea pigs in series. Control series of guinea pigs were started from the original virus donors. There was no evidence of loss of virulence in either strain by passage through mice.

DEER MICE

Thirteen deer mice, *Peromyscus maniculatus artemisiae*, from the vicinity of Hamilton, Mont., were each injected intraperitoneally with 0.05 cc of guinea-pig passage blood virus 293 on May 9, 1933. Two of these mice were killed each day from the fourth to the ninth and one on the tenth day. An intraperitoneal transfer of emulsified spleen tissue was made from each mouse to one male guinea pig.

Two control guinea pigs injected with virus 293, which was the source of inoculum for the mice, died of typical spotted fever.

No fatalities occurred among the inoculated deer mice during the experiment, nor were there any gross lesions such as were present in the field mice. Uncertain or possibly negative results were obtained from the 2 seventh-day transfers and from 1 each of those made on the eighth and ninth days. The other nine transfers produced typical fatal infections in the injected guinea pigs, and characteristic gross lesions were found on necropsy.

HOUSE MICE

Nine house mice, *Mus musculus*, from various residences in Hamilton were each injected with 0.05 cc of passage virus 269 on February 27. These mice were all sacrificed, 2 on the seventh day and 1 on each day from the eighth to the eleventh. Emulsified spleen tissue was transferred from each mouse to two male guinea pigs, intraperitoneally.

Two control guinea pigs injected with 1 cc of virus 269, which was the source of inoculum for the mice, died of spotted fever.

None of the mice died during the experiment, and when killed and necropsied none showed gross lesions suggestive of spotted fever, nor did spotted fever result from any of the transfers. Five of the guinea pigs injected with spleen tissue died of intercurrent infection. On the twelfth day the remaining 7 received an immunity test of 1 cc of passage virus; all 7 developed typical spotted fever.

SUMMARY AND DISCUSSION

Meadow mice have been proved highly susceptible to Rocky Mountain spotted fever. Laboratory infection in them differed from that observed in most other native rodents in that fatalities and scrotal involvement were frequent. The virus was maintained in meadow mice without apparent loss of virulence through 4 consecutive transfers over a period of 28 days. Infected nymphal ticks transmitted the virus to meadow mice, from which noninfected larvae acquired the infection, thus demonstrating tick-to-tick transfer of the virus through this rodent as a medium.

Deer mice were also found definitely susceptible, but evidently in less degree than meadow mice No fatalities occurred among the virus-injected deer mice, and characteristic gross lesions were lacking in those that were sacrificed for passage material

House mice were distinctly resistant to the virus, and it was not possible to recover the infection from them 7 to 11 days after injection.

It appears probable that meadow mice and deer mice are natural avenues for the transfer of spotted fever virus from infected to non-infected ticks In some regions, at least, it is possible that they (particularly species of *Microtus*) may be factors of importance in the natural maintenance and spread of the virus. This is most likely in parts of the United States in which *D variabilis* is prevalent, since mice are apparently far more important hosts of the larval and nymphal stages of this tick than of those of *D andersoni.*

REFERENCES

Rucker, W C: (1912) Rocky Mountain spotted fever Pub. Health Rep., **27**. 1465–1482

Fricks, L. D · (1916) Rocky Mountain spotted fever. A report of laboratory investigations of the virus Pub Health Rep., **31** 516–521

Wolbach, S. B: (1919) Studies on Rocky Mountain spotted fever Jour Med. Res., **41**: 1–197

METHYLENE BLUE IN THE TREATMENT OF HCN GAS POISONING—A CORRECTION

In the Public Health Reports for December 1, 1933, page 1443, 1 percent methylene blue solution is stated as the solution used by Brooks in her experimental work with HCN poisoning of rats. This is an error. The solution of methylene blue which Brooks used was 0.01 M.

Although no reference was made to Brooks' work in CO poisoning, it is of interest to note that intravenous injections of 0.01 percent solution of methylene blue were used in her experiments with rabbits.

COURT DECISION ON PUBLIC HEALTH

Revocation by commissioners of shell fisheries of certificate of sanitary condition sustained.—(Rhode Island Supreme Court; *Meunier* v. *Commissioners of Shell Fisheries*, 168 A. 907; decided Nov. 10, 1933.) The duty of enforcing the Rhode Island statutes providing for the protection of the shell fisheries in the public waters of the State and for the protection of the public health as related to the consumption of shellfish as food was imposed on the commissioners of shell fisheries. By General Laws 1923, chapter 233, section 6, it was provided that

"Said commissioners may issue certificates from time to time to any person whose premises or grounds are found by them to be in a sanitary condition, setting forth that they have examined such opening or packing house or such shellfish ground and that the methods followed in the preparation of oysters or other shellfish in such opening or packing house are sanitary and that the grounds inspected are in proper sanitary condition for the production of shellfish for consumption as food " Section 4 of said chapter provided that the commissioners should inspect any or all of the leased oyster and other shellfish grounds to determine whether the said grounds were in a proper sanitary condition for the production of shellfish for consumption as food And in General Laws 1923, chapter 230, section 7, there was contained the provision that "Said commissioners shall make all necessary regulations for enforcing the laws of the State relating to shell fisheries and for executing the duties imposed upon them by law." As a prerequisite to the issuance of a certificate of sanitary condition an applicant for such certificate was required to sign an application, on a form provided by the commissioners, whereby he agreed "to handle, ship, or offer for sale only such shellfish as had been obtained from beds or areas examined, approved by the board and to comply with the rules and regulations of your board governing equipment and methods of handling shellfish."

A certificate of sanitary condition which had been issued by the commissioners was rescinded by them. The person to whom the certificate had been granted was charged by the commissioners with "having in his possession quahaugs under legal size, purchasing shellfish from unlicensed fishermen, keeping inaccurate records of the purchases of shellfish and handling shellfish from areas not approved by the commissioners." In a certiorari proceeding to review the action of the commissioners, the petitioner contended that, inasmuch as there was no finding that his premises were not in a sanitary condition, the commissioners were without jurisdiction to revoke his certificate. The supreme court said that there would be force in this contention if section 6, referred to above, stood alone, but then went on to mention the other statutory provisions above referred to. Concerning the statute relative to the making of regulations, it was said by the court that "Under this power of regulation, the commissioners may make such rules as are reasonably conducive to making effective the intent of the statute relating to shellfish." With regard to the agreement required of an applicant for a certificate, the court stated:

> We deem this to be a reasonable exercise of the power to make rules and regulations as conferred on the commissioners by statute. It would be an anomaly to confine the power of the commissioners in issuing certificates of sanitary condition to the places where shellfish are sold when the same might have been obtained from polluted areas. * * *

In conclusion, the court said that "As there was competent evidence tending to prove that the petitioner had violated his agreement, the action of the commissioners in revoking his certificate will not be reviewed on certiorari [Case cited] The writ of certiorari is quashed."

DEATHS DURING WEEK ENDED FEBRUARY 24, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Feb 24, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	9,124	8,802
Deaths per 1,000 population, annual basis	12 7	12.3
Deaths under 1 year of age	597	640
Deaths under 1 year of age per 1,000 estimated live births	56	[1] 55
Deaths per 1,000 population, annual basis, first 8 weeks of year	12 6	12.6
Data from industrial insurance companies		
Policies in force	67,553,818	68,993,332
Number of death claims	13,510	13,934
Death claims per 1,000 policies in force, annual rate	10 4	10 5
Death claims per 1,000 policies, first 8 weeks of year, annual rate	10 7	11.3

[1] Data for 81 cities

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended March 3, 1934, and March 4, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar 3, 1934, and Mar 4, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933
New England States								
Maine			6	13	4	4	0	0
New Hampshire				11	206		0	0
Vermont		2			44	29	0	0
Massachusetts	9	24		8	2,375	323	1	1
Rhode Island	5	3		8	8		0	0
Connecticut	3	1	24	24	49	178	0	1
Middle Atlantic States								
New York	53	62	[1] 32	[1] 53	1,175	3,301	4	1
New Jersey	18	18	28	75	472	1,093	0	4
Pennsylvania	65	69			3,823	1,328	0	17
East North Central States								
Ohio	30	44	15	23	342	609	1	2
Indiana	20	30	103	96	807	40	1	3
Illinois	39	47	60	70	1,139	277	9	21
Michigan	13	10	2	13	73	975	1	2
Wisconsin	6	5	98	143	1,136	106	5	1
West North Central States								
Minnesota	8	5			227	1,444	1	6
Iowa [2]	8	7	3		187	2	1	1
Missouri	37	32	133	10	990	284	1	11
North Dakota	3	5	55	57	321	221	0	2
South Dakota	2	4	4	2	340	8	1	0
Nebraska	23	10	6	7	239	16	0	0
Kansas	15	14	5	9	246	292	1	0
South Atlantic States								
Delaware	1	4	1		123	3	0	0
Maryland [2]	12	12	15	44	735	11	0	0
District of Columbia	7	9	1	1	514	3	0	0
Virginia	23	14			940	399	2	1
West Virginia	24	21	118	53	73	281	1	1
North Carolina	27	18	80	168	2,421	370	0	2
South Carolina	16	12	799	1,151	532	129	0	0
Georgia [3]	14	19		381	1,917	28	0	5
Florida	5	10	2	23	111	10	1	0
East South Central States:								
Kentucky	17	14	44	82	269	67	1	1
Tennessee	10	16	215	93	1,411	89	2	3
Alabama [3]	31	11	171	148	872	33	0	0
Mississippi [2]	5	8					0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar 3, 1934, and Mar 4, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933
West South Central States								
Arkansas	7	4	50	101	561	37	1	1
Louisiana	28	8	18	6	159	51	0	2
Oklahoma [4]	18	10	131	160	625	18	3	3
Texas [3]	114	54	902	317	2,312	615	2	4
Mountain States								
Montana	3		25	31	12	205	1	1
Idaho	4	1		1	33	63	0	0
Wyoming [5]				2	51	1	1	0
Colorado	3	3		58	188	4	0	8
New Mexico	7	10	2	18	118	2	1	0
Arizona	1	2	16	2	39	24	0	0
Utah [2]		3		4	711	5	1	0
Pacific States								
Washington	2	7		1	189	32	0	1
Oregon		1	91	43	117	160	1	1
California	33	62	60	133	1,570	911	2	3
Total	769	725	3,341	3,643	30,806	14,081	47	110

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933
New England States								
Maine	0	0	20	20	0	0	2	1
New Hampshire	0	0	14	35	0	0	0	0
Vermont	0	0	7	13	0	0	0	0
Massachusetts	0	0	216	436	0	0	2	0
Rhode Island	0	0	15	30	0	0	0	0
Connecticut	0	0	53	109	0	2	1	0
Middle Atlantic States								
New York	1	1	782	981	0	0	7	8
New Jersey	1	0	182	335	0	0	1	2
Pennsylvania	0	1	1,038	1,171	0	0	9	6
East North Central States								
Ohio	1	0	749	673	1	3	2	8
Indiana	0	1	281	195	3	1	0	2
Illinois	1	0	701	477	3	15	6	5
Michigan	1	1	786	548	9	1	7	1
Wisconsin	0	2	308	162	26	0	1	1
West North Central States								
Minnesota	0	0	45	86	8	0	0	1
Iowa [2]	0	0	78	41	12	44	1	0
Missouri	1	0	71	112	0	5	1	1
North Dakota	0	0	24	27	0	1	0	0
South Dakota	1	0	13	21	3	4	0	0
Nebraska	1	0	30	40	0	0	1	0
Kansas	0	0	106	56	2	2	4	1
South Atlantic States								
Delaware	0	0	19	6	0	0	0	0
Maryland [2]	0	0	91	97	0	0	1	2
District of Columbia	0	0	16	13	0	0	1	0
Virginia	0	0	46	53	0	0	2	2
West Virginia	0	0	81	31	2	0	3	2
North Carolina	0	0	53	33	2	5	0	4
South Carolina	0	1	13	11	5	0	1	3
Georgia [3]	0	0	7	12	0	3	4	3
Florida	2	0	4	5	0	0	0	4
East South Central States								
Kentucky	0	0	56	55	0	1	1	4
Tennessee	1	0	31	63	0	1	4	7
Alabama [3]	0	0	11	13	5	1	2	2
Mississippi [2]	0	0	25	11	0	0	0	3

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar 3, 1934, and Mar 4, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933	Week ended Mar 3, 1934	Week ended Mar 4, 1933
West South Central States								
Arkansas	5	0	9	14	1	0	1	6
Louisiana	1	0	25	14	1	0	11	2
Oklahoma [4]	0	0	18	23	12	1	3	2
Texas [3]	0	0	146	65	18	12	16	6
Mountain States								
Montana	0	0	20	12	0	0	0	9
Idaho	0	0	15	4	5	4	1	1
Wyoming [5]	0	0	3	1	0	0	0	0
Colorado	0	0	72	55	11	0	5	0
New Mexico	0	0	20	12	1	0	3	1
Arizona	0	0	11	18	0	0	0	0
Utah [2]	0	0	4	18	0	0	0	1
Pacific States								
Washington	0	1	72	65	4	4	2	0
Oregon	0	0	39	20	0	10	0	0
California	4	0	234	239	1	56	3	7
Total	21	8	6,660	6,531	135	176	109	108

[1] New York City only.
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended Mar 3, 1934, 18 cases, as follows Georgia, 3, Alabama, 12, Texas, 3
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended Mar 3, 1934, Wyoming, 3 cases

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1934										
California	15	209	203		4,467	4	25	1,534	65	63
Colorado	1	34	10		114		0	162	16	3
Montana	2	6	46		33		0	92	3	7
Oklahoma [1]	8	157	469	19	1,761	1	0	112	12	20
Oregon	1	15	123		149		0	223	23	8
Puerto Rico		59	87	3,932	65	1	0		0	32
South Dakota	1	8	22	3	1,694		1	110	8	2
Texas	13	718	2,102	1,328		185	0	629		64
Virginia	11	170	491	2	1,830	6	2	413	1	37
Wisconsin	6	28	315		1,477		1	705	133	2

[1] Exclusive of Oklahoma City and Tulsa

January 1934

	Cases
Botulism	
California	5
Colorado	3
Chicken pox:	
California	3,244
Colorado	678
Montana	236
Oklahoma [1]	92
Oregon	195
Puerto Rico	30
South Dakota	121
Virginia	499
Wisconsin	2,401
Diarrhea and dysentery:	
Virginia	26

January, 1934—Continued

	Cases
Dysentery	
California (amoebic)	20
California (bacillary)	28
Colorado	4
Oklahoma [1]	6
Oregon	3
Puerto Rico	203
Favus Montana	1
Filariasis. Puerto Rico	7
Food poisoning California	50
German measles:	
California	174
Montana	2
Wisconsin	69

January, 1934—Continued

	Cases
Granuloma, coccidioidal	
California	5
Impetigo contagiosa:	
Colorado	30
Montana	14
Oregon	59
Leprosy California	3
Lethargic encephalitis	
California	8
Oregon	2
Texas	7
Virginia	2
Mumps.	
California	2,223
Colorado	156

[1] Exclusive of Oklahoma City and Tulsa.

January 1934—Continued

	Cases
Mumps—Continued	
Montana	4
Oklahoma [1]	53
Oregon	13
Puerto Rico	37
South Dakota	39
Virginia	108
Wisconsin	121
Ophthalmia neonatorum	
California	4
Puerto Rico	6
Virginia	1
Wisconsin	2
Paratyphoid fever	
California	2
Puerto Rico	2
Texas	2
Puerperal septicemia	
Puerto Rico	4
Rabies in animals	
California	111
Scabies	
Montana	7
Oklahoma [1]	33
Oregon	73

January 1934—Continued

	Cases
Septic sore throat	
California	17
Colorado	5
Montana	3
Oklahoma [1]	21
Oregon	4
Virginia	31
Tetanus	
California	2
Puerto Rico	9
Virginia	2
Tetanus, infantile	
Puerto Rico	15
Trachoma	
California	14
Montana	24
Oklahoma [1]	5
Puerto Rico	44
South Dakota	1
Virginia	1
Trichinosis	
California	1
Tularaemia	
California	1
Montana	1

January 1934—Continued

	Cases
Tularaemia—Continued	
Virginia	10
Undulant fever	
California	11
Oregon	1
South Dakota	1
Virginia	4
Wisconsin	3
Vincent's infection	
Colorado	2
Montana	2
Oklahoma [1]	3
Oregon	12
Whooping cough	
California	1,730
Colorado	408
Montana	74
Oklahoma [1]	25
Oregon	133
Puerto Rico	426
South Dakota	76
Virginia	424
Wisconsin	1,385
Yaws	
Puerto Rico	1

[1] Exclusive of Oklahoma City and Tulsa

WEEKLY REPORTS FROM CITIES

City reports for week ended Feb 24, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	5	1	0	0	0	2	33
New Hampshire											
Concord	0	------	1	41	2	0	0	1	0	0	14
Manchester	0	------	2	7	2	3	0	0	0	0	12
Nashua	0	------	0	1	0	0	0	0	0	2	-------
Vermont											
Barre	0	------	0	0	0	0	0	0	0	0	4
Burlington	0	------	0	0	0	2	0	0	0	3	21
Massachusetts											
Boston	0	------	2	262	32	63	0	9	0	51	262
Fall River	0	------	1	2	1	3	0	1	0	3	32
Springfield	1	------	0	1	1	7	0	0	0	8	41
Worcester	0	------	0	44	8	10	0	2	0	14	59
Rhode Island											
Pawtucket	0	------	0	0	0	2	0	0	0	0	0
Providence	0	------	0	3	12	8	0	2	0	24	65
Connecticut											
Bridgeport	0	5	3	2	5	10	0	1	0	0	42
Hartford	2	------	0	1	11	8	0	2	0	5	59
New Haven	0	------	0	2	4	1	0	1	0	0	46
New York											
Buffalo	1	0	1	311	27	22	0	10	0	22	154
New York	34	16	15	56	206	291	0	76	6	94	1,703
Rochester	0	------	0	0	5	43	0	1	0	8	66
Syracuse	0	------	0	2	1	8	0	0	0	32	51
New Jersey											
Camden	0	------	0	93	3	7	0	0	0	0	38
Newark	1	5	1	2	14	14	0	5	0	25	111
Trenton	1	------	2	30	4	9	0	0	0	1	35
Pennsylvania											
Philadelphia	3	5	9	1,216	59	130	0	27	2	31	539
Pittsburgh	5	7	6	103	46	41	0	11	4	51	187
Reading	1	------	0	3	5	8	0	0	0	9	32
Scranton	0	------	0	1	0	9	0	0	0	8	-------
Ohio											
Cincinnati	4	------	0	206	14	32	0	4	0	17	160
Cleveland	5	66	4	34	17	123	0	11	0	86	206
Columbus	2	1	1	9	5	35	0	3	1	5	85
Toledo	2	1	1	77	9	37	0	4	0	73	84

City reports for week ended Feb. 24, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Indiana											
Fort Wayne	6	------	0	8	21	16	0	1	0	0	20
Indianapolis	4	------	1	285	23	16	0	3	1	41	------
South Bend	0	------	0	0	1	4	0	0	0	0	21
Terre Haute	0	------	0	21	2	0	0	0	0	4	23
Illinois											
Chicago	4	6	4	97	64	287	0	41	2	167	768
Cicero	0	------	0	0	0	0	0	0	0	0	6
Springfield	------	------	------	------	------	------	------	------	------	------	------
Michigan											
Detroit	11	2	4	13	41	144	0	19	0	93	305
Flint	0	------	0	10	10	78	0	2	0	7	33
Grand Rapids	0	------	1	0	2	21	0	0	0	1	31
Wisconsin											
Kenosha	0	------	0	1	0	36	1	0	0	1	5
Milwaukee	0	------	0	2	7	77	1	4	0	105	85
Racine	0	------	0	2	0	7	0	1	0	5	6
Superior	0	------	0	0	1	0	0	0	0	0	6
Minnesota											
Duluth	0	------	0	0	1	0	0	1	0	0	10
Minneapolis	7	------	0	3	3	36	0	3	1	18	108
St Paul	0	------	0	0	8	11	0	0	1	14	58
Iowa											
Des Moines	0	------	------	3	------	21	0	------	0	0	24
Sioux City	1	------	------	13	------	1	0	------	0	1	------
Waterloo	0	------	------	0	------	0	0	------	0	8	------
Missouri											
Kansas City	3	------	0	4	17	15	0	4	0	8	121
St Joseph	1	------	0	7	8	5	0	2	0	0	36
St Louis	32	------	2	659	14	27	0	9	1	57	243
North Dakota:											
Fargo	0	------	0	128	0	1	0	0	0	4	10
Grand Forks	0	------	0	0	0	0	0	0	0	0	0
South Dakota											
Aberdeen	0	------	0	1	0	0	0	0	0	0	------
Nebraska											
Omaha	2	------	0	176	10	8	0	3	0	7	59
Kansas											
Topeka	0	------	0	0	8	3	0	0	0	11	33
Wichita	0	------	0	1	5	2	0	0	0	6	27
Delaware											
Wilmington	2	------	0	66	2	2	0	2	0	3	24
Maryland											
Baltimore	1	6	3	238	33	30	0	19	0	175	264
Cumberland	1	2	0	0	0	1	0	1	0	9	14
Frederick	------	------	------	------	------	------	------	------	------	------	------
District of Columbia											
Washington	4	2	1	473	14	25	0	10	0	41	166
Virginia:											
Lynchburg	1	------	0	0	0	0	0	0	0	2	15
Norfolk	2	------	0	33	5	2	0	3	0	1	31
Richmond	2	2	3	38	5	4	0	3	0	0	58
Roanoke	0	------	0	0	1	3	0	0	0	2	12
West Virginia											
Charleston	0	------	0	0	1	1	0	1	0	0	9
Huntington	0	------	0	1	0	9	0	0	0	0	------
Wheeling	0	------	0	0	4	10	0	0	0	3	17
North Carolina:											
Raleigh	1	------	0	20	2	3	0	0	0	18	13
Wilmington	0	------	0	0	0	0	0	1	0	0	7
Winston-Salem	2	5	0	112	2	3	0	1	0	0	20
South Carolina:											
Charleston	0	61	3	20	0	0	0	2	1	0	30
Columbia	------	------	------	------	------	------	------	------	------	------	------
Greenville	0	------	1	1	4	0	0	0	0	10	16
Georgia:											
Atlanta	1	31	3	283	18	3	0	4	1	3	105
Brunswick	0	1	1	154	0	0	0	0	0	0	6
Savannah	0	31	1	146	4	0	0	1	0	0	34
Florida											
Miami	1	------	0	13	5	0	0	5	0	8	42
Tampa	1	------	0	0	1	0	0	1	0	0	28
Kentucky											
Ashland	0	------	------	0	------	0	0	------	0	0	------
Lexington	0	------	0	0	5	1	0	2	0	0	21
Louisville	6	3	0	1	12	29	0	1	2	15	76
Tennessee											
Memphis	1	------	2	353	11	3	2	8	2	7	88
Nashville	0	------	1	126	10	1	0	2	0	18	66

City reports for week ended Feb. 24, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Alabama											
Birmingham	2	30	3	16	12	6	0	6	0	3	79
Mobile	0	------	1	12	3	0	0	1	0	0	37
Montgomery	8	1	------	13	------	0	0	------	0	9	------
Arkansas											
Fort Smith	1	------	------	94	------	3	0	------	0	0	------
Little Rock	[1] 1	------	0	64	2	1	0	0	0	3	2
Louisiana											
New Orleans	15	9	4	24	16	31	0	12	3	0	167
Shreveport	4	------	1	5	5	2	0	2	0	5	33
Oklahoma											
Oklahoma City	3	12	1	47	10	5	0	0	0	6	45
Tulsa	0	------	------	89	------	3	0	------	0	1	------
Texas											
Dallas	4	2	2	0	11	5	0	2	0	4	79
Fort Worth	3	------	0	0	7	10	0	0	1	0	31
Galveston	0	------	0	0	6	2	0	1	0	0	26
Houston	6	------	1	2	11	6	3	6	2	0	80
San Antonio	2	------	2	2	11	10	0	6	1	2	68
Montana											
Billings	0	------	0	1	0	1	0	0	0	2	6
Great Falls	0	------	0	3	1	0	0	0	1	6	5
Helena	0	------	0	0	0	0	0	0	0	0	5
Missoula	0	------	0	0	0	0	0	0	0	0	8
Idaho											
Boise	0	------	0	4	2	0	2	0	0	4	10
Colorado											
Denver	2	29	3	56	8	20	0	1	0	91	77
Pueblo	0	------	0	0	1	2	0	0	0	15	9
New Mexico											
Albuquerque	0	------	0	1	3	5	0	3	0	3	18
Utah											
Salt Lake City	0	------	0	476	4	8	0	0	0	21	44
Nevada											
Reno	0	------	0	0	0	0	0	0	0	0	5
Washington											
Seattle	0	------	7	6	3	27	1	4	0	63	99
Spokane	0	------	------	92	1	1	0	1	0	8	29
Tacoma	0	------	0	26	6	0	0	1	0	19	39
Oregon											
Portland	0	------	0	2	9	11	1	1	0	6	81
Salem	0	------	0	0	0	0	0	0	1	4	------
California											
Los Angeles	------	------	------	------	------	------	------	------	------	------	------
Sacramento	0	3	3	1	2	3	0	3	0	1	35
San Francisco	0	------	1	32	9	16	0	10	0	24	181

[1] Nonresident

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
New York:				District of Columbia:			
New York	3	3	0	Washington	0	1	0
Pennsylvania:				Georgia:			
Philadelphia	1	0	0	Atlanta	1	0	0
Pittsburgh	1	0	0	Kentucky:			
Ohio:				Lexington	1	0	0
Cleveland	1	1	0	Tennessee:			
Indiana:				Memphis	2	0	0
Indianapolis	2	0	0	Louisiana:			
South Bend	1	0	0	New Orleans	0	1	0
Illinois:				Montana:			
Chicago	5	2	0	Great Falls	1	1	0
Missouri:				California:			
St. Louis	4	2	0	San Francisco	0	0	1

Lethargic encephalitis.—Cases: Boston, 1; Philadelphia, 1; Charleston, S. C., 1; Mobile, 1; New Orleans, 2.

Pellagra.—Cases: Lynchburg, 1; Raleigh, 1; Tampa, 1; New Orleans, 2; Dallas, 1; Sacramento, 1.

Typhus fever.—Cases: Atlanta, 2; Montgomery, 1. Deaths: New York, 1.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—2 weeks ended February 24, 1934.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended February 24, 1934, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Poliomyelitis	3
Chicken pox	223	Puerperal septicemia	3
Diphtheria	32	Scarlet fever	164
Erysipelas	26	Tuberculosis	100
German measles	11	Typhoid fever	69
Influenza	15	Undulant fever	1
Measles	161	Whooping cough	509
Ophthalmia neonatorum	1		

CUBA

Habana—Communicable diseases—4 weeks ended February 24, 1934.—During the 4 weeks ended February 24, 1934, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	11	4	Tuberculosis	14	4
Leprosy	1		Typhoid fever	[1] 5	1
Malaria	[1] 21	1			

[1] Includes cases from outside Habana

CZECHOSLOVAKIA

Communicable diseases—December 1933.—During the month of December 1933, certain communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	2		Paratyphoid fever	23	1
Cerebrospinal meningitis	13	4	Poliomyelitis	10	1
Chicken pox	590		Puerperal fever	47	21
Diphtheria	2,907	198	Scarlet fever	2,637	35
Dysentery	11		Trachoma	124	
Influenza	130	4	Typhoid fever	391	36
Malaria	9		Typhus fever	14	

ITALY

Communicable diseases—4 weeks ended September 17, 1933.—During the 4 weeks ended September 17, 1933, cases of certain communicable diseases were reported in Italy, as follows:

Disease	Aug 21-27		Aug 28-Sept 3		Sept 4-10		Sept 11-17	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	53	43	56	47	42	31	44	36
Cerebrospinal meningitis	6	6	2	2	5	5	7	6
Chicken pox	110	71	72	42	45	33	56	40
Diphtheria and croup	386	217	427	244	506	287	468	267
Dysentery	45	24	58	27	53	26	27	20
Lethargic encephalitis	1	1	1	1	2	2	1	1
Measles	761	189	1,450	177	590	142	449	127
Poliomyelitis	15	14	16	12	10	9	16	14
Scarlet fever	270	128	228	123	292	139	277	118
Typhoid fever	1,336	591	1,139	533	1,223	566	1,205	572

JAMAICA

Communicable diseases—4 weeks ended February 24, 1934.—During the 4 weeks ended February 24, 1934, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	1	29	Leprosy		5
Diphtheria	1	2	Puerperal fever		1
Dysentery	17	19	Tuberculosis	23	86
Erysipelas		1	Typhoid fever	34	78

PUERTO RICO

Notifiable diseases—4 weeks ended February 24, 1934.—During the 4 weeks ended February 24, 1934, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico, as follows:

Disease	Cases	Disease	Cases
Chicken pox	159	Paratyphoid fever	4
Diphtheria	80	Pellagra	9
Dysentery	106	Ringworm	7
Filariasis	7	Syphilis	25
Influenza	45	Tetanus	1
Leprosy	2	Tetanus, infantile	3
Malaria	[1] 18,703	Trachoma	47
Measles	68	Tuberculosis	552
Mumps	33	Typhoid fever	32
Ophthalmia neonatorum	6	Whooping cough	362

[1] Includes results from a special survey

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Feb 23, 1934, pp 276–288 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Mar 30, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands—During the week ended March 3, 1934, cholera was reported in the Philippine Islands as follows Bohol Province—Calape, 7 cases, 5 deaths, Carmen, 3 cases, 1 death; Clarin, 10 cases, 8 deaths; Inabanga, 15 cases, 5 deaths, Loon, 7 cases, 7 deaths, Tubigon, 20 cases, 15 deaths Oriental Negros Province—Tanjay, 6 cases, 3 deaths, Vallehermoso, 6 cases, 4 deaths

Plague

Angola.—A report states that at the end of December 1933 and the beginning of January 1934, 32 cases of plague with 17 deaths occurred in an almost inaccessible part of the Bulo-Bulo Mountain, about 30 miles from Lobito, Angola. A supervisory service has been established around the focus of infection

Smallpox

Great Britain—England—Blackburn—A report from the health section of the Secretariat of the League of Nations dated February 26, 1934, states that on January 26, a cotton mill worker, aged 62, in charge of cotton from Egypt fell ill but came to work the next day, the 27th. On the 28th, a rash appeared without any definite characteristics. The man was admitted to an isolation hospital on February 2, the disease being diagnosed as malignant varicella, and he died on the 3d.

From February 7 to 12, 7 other members of his family fell ill, and the disease was then diagnosed as a serious form of smallpox. Since then, 12 other cases have occurred, all among persons who had been in contact with the first case, bringing the total up to 20 cases, 3 of which ended in death.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 12

MARCH 23 - - - - - 1934

IN THIS ISSUE

Viability of Endamoeba Histolytica and Endamoeba Coli
The American Dog Tick as a Host of Bacterium Tularense
Most Probable Numbers for Evaluating Coli-Aerogenes Test
Deaths in Large Cities During the Week Ended March 3
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world, (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health

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CONTENTS

	Page
Viability of Endamoeba histolytica and Endamoeba coli—Effect of drying	379
The American dog tick, Dermacentor variabilis, as a host of Bacterium tularense	386
Most probable numbers for evaluation of coli-aerogenes test by fermentation tube method	393
Court decision on public health	406
Deaths during week ended March 3, 1934	
Deaths and death rates for a group of large cities in the United States	407
Death claims reported by insurance companies	407
PREVALENCE OF DISEASE	
United States:	
Current weekly State reports:	
Reports for weeks ended March 10, 1934, and March 11, 1933	408
Summary of monthly reports from States	410
Cases of venereal diseases reported for January 1934	411
Weekly reports from cities.	
City reports for week ended March 3, 1934	412
Foreign and insular	
Belgium—Deaths 1932	415
Canada—Provinces—Communicable diseases—2 weeks ended February 24, 1934	415
Great Britain—Scotland—Vital statistics:	
Quarter ended December 31, 1933	416
Year 1933	416
India—Vital statistics	416
Cholera, plague, smallpox, typhus fever, and yellow fever:	
Cholera	417
Smallpox	417

PUBLIC HEALTH REPORTS

VOL. 49 MARCH 23, 1934 NO. 12

VIABILITY OF ENDAMOEBA HISTOLYTICA AND ENDAMOEBA COLI

Effect of Drying

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In connection with studies of the sources of infections of amoebic dysentery, it appeared desirable to determine the time during which the causative organism remained viable when smeared on the hands. This became especially important, since many students of amoebiasis have considered that the infection was spread largely through direct transfer on food of *Endamoeba*-cyst-bearing fecal material from carriers to well persons, in whom infection was thus established It is generally accepted by students of protozoa that living forms of intestinal protozoa, especially *Amoebae*, may be distinguished from dead forms by staining the preparation with eosin. If the parasite takes up the stain from a solution (aqueous) of 1:1000 eosin, the organism is considered dead; while if it refuses to take the stain, it is to be regarded as alive.

To those not familiar with the test it is rather surprising to note the sharp differentiation to be effected by the procedure. The method employed in these experiments was as follows, with such variations as are noted under individual tests.

The fingers and thumb in some instances were dosed with a 24-hour culture of *Escherichia coli*, in order that the effect of drying on this organism might be contrasted with the effect of drying on *Endamoeba histolytica*. The stool specimen containing a sufficient number of the cyst forms of *Endamoeba histolytica* was smeared on the fingers of the healthy volunteer, or the fingers were dipped into a homogenous stool emulsion. In either case, the material was allowed to dry.

The amount of fecal material put on the fingers was quite liberal. At varying periods of time after the contamination of the fingers or thumb, the fingers and thumb were immersed in a sterile centrifuge tube containing sterile distilled water or normal salt solution, and the feces washed off as completely as practicable.

The suspension was rotated at low speed in the centrifuge for about 5 minutes At the end of this time a drop of the sediment was collected with a pipette and mixed on a glass slide with an approximately equal volume of the eosin solution. The mixture was then examined with dry objectives, using first the low power, and, when necessary for complete identification, the higher power.

In experiments where counts were made, all *Amoebae* on the microscopic preparation were enumerated Throughout the experiment the temperature of the laboratory was at 27° to 29°C

In the absence of any information on the longevity of *Endamoeba histolytica* cysts on human hands, a number of preliminary experiments were necessary to determine the starting point of washing the individual fingers after contaminating them.

PRELIMINARY EXPERIMENTS

Materials—Twenty-four-hour-old stool containing many *Endamoeba histolytica* cysts, kept in ice-box.

Twenty-four-hour culture of *Esch. coli*, Endo plates, sterile distilled water, sterile 50-cc centrifuge tubes.

The fingers and thumbs of both hands were used.

Procedure.—The fingers and thumbs of both hands were first contaminated with the 24-hour culture of *Esch. coli*. They were dipped immediately in a beaker containing an even emulsion of the stool (the stool was well emulsified in sterile distilled water and strained through one layer of gauze into a sterile beaker).

The hands were then held over a small, clean basin to collect any drippings. After the intervals shown in the tables, a finger or thumb was washed in a large sterile centrifuge tube about two thirds full of sterile distilled water.

When the experiment was completed, these washings were centrifuged at low speed for about 4 minutes. The sediment was cultured for *Esch. coli* and examined microscopically for *E. histolytica* cysts, using 1:1000 aqueous solution of eosin.

Results.—The following tables present the results of the preliminary experiments:

EXPERIMENT 1

Date	Material used	Period of drying—Interval between contamination and washing of fingers			
		50 min.	80 min.	110 min.	140 min.
Feb. 28, 1934	Esch. coli	Dead	Dead	Dead	Dead.
	E. histolytica cysts	do	do	do	Do

EXPERIMENT 2

Date	Material used	Period of drying—Interval between contamination and washing of fingers			
		10 min	15 min	20 min	25 min
Mar 1, 1934	Esch coli E histolytica cysts	Dead do	Dead do	Dead do	Dead Do

EXPERIMENT 3

		3 min	4½ min	5½ min	6½–7½ min.
Mar 1, 1934	Esch coli E histolytica cysts	Viable do	Viable Few viable, mostly dead	Viable Dead	Viable Dead

EXPERIMENT 4

		3 min	4 min	5 min	6 min
Mar 3, 1934	Esch coli E histolytica cysts	Viable do	Viable Few viable, mostly dead	Viable Dead	

Conclusion —This series of experiments shows that this strain of *Endamoeba histolytica* cysts dies within 5 minutes on human hands when spread in the concentration indicated above and allowed to dry at room temperature, and that *Esch. coli* is more resistant to drying than the strain of *Endamoeba histolytica* cysts used

LATER EXPERIMENTS

In classifying *Endamoeba histolytica* cysts as "large" and "small", as found in certain of the reports of these experiments, an opinion was based on the general impression given the observer, but without the making of measurements with a micrometer. There is a difference of opinion among protozoologists as to whether the size of the cysts is a matter of any significance.

Experiment 5 (*Mar. 5, 1934*).—The stool specimen was about 5 hours old and came from a clinically active case of dysentery of several weeks' duration. The specimen was semiliquid and brownish in color. No blood was evident to naked-eye examination. Direct microscopic examination showed some motile forms (trophozoites) and a moderate number of cysts. both large and small varieties being represented, the latter more numerous.

After preliminary dosing of the hands with a culture of *Esch coli*, the fecal specimen was applied liberally enough to leave a very distinct brownish film. The film was dry after about 3 minutes. The results of examinations made at various intervals after the smearing (not after drying) are shown here.

After 5 minutes· About half the cysts living and half dead.
After 7 minutes· The dead cysts far outnumber the living.
After 9 minutes All cysts dead.
After 10 minutes. One cyst living; 10 dead
After 11 minutes. One small cyst living, several small cysts dead All large cysts dead.

A control specimen of the material used but not dried showed at the end of the experiment 13 small cysts living, none dead. Of large cysts counted, 5 were living and 1 was dead.

It is to be expected that in any preparation a certain number of protozoa will be dead in the natural course of events without reference to experimental conditions.

At this stage of the work it seemed desirable to ascertain the resistance of cysts of *E. coli.*

Experiment 6 (Mar. 5, 1934).—A formed stool specimen from a healthy 20-year-old female was available, which specimen contained *E. coli* in cyst form only. The specimen was about 6 hours old when used

The results were in striking contrast with those obtained with *E. histolytica*, since at the end of 15 minutes none of the cysts was found dead. Accordingly, a modification of the test was run by drying an emulsion of the same stool specimen, 30 hours old, on a glass slide.

Experiment 7 (Mar. 5, 1934)—E. coli cysts.[1]—After varying periods, as shown in the accompanying tabulation, the dried films were restored to the form of an emulsion, the eosin solution was added, and the cysts were counted, with the results shown in the table.

In this test and in all other tests where counts are shown all of the protozoa in the usable field were counted. The results are as follows:

	Living	Dead		Living	Dead
After 5 minutes' drying	7	0	After 40 minutes' drying	30	1
After 10 minutes' drying	11	0	After 60 minutes' drying	30	3
After 15 minutes' drying	13	0	After 90 minutes' drying	26	3
After 20 minutes' drying	25	0	After 120 minutes' drying	33	1
After 30 minutes' drying	30	2			

Experiment 8 (Mar. 6, 1934).—This test was carried out to determine the effect of drying the cyst-bearing fecal emulsion of *Endamoeba histolytica* on glass slides.

A brown semisolid stool from a clinical case of dysentery was available. The specimen had been kept in the icebox for 28 hours. An emulsion was made in distilled water. The specimen contained both large and small cysts of *Endamoeba histolytica*, the small variety predominating.

[1] Since no count for living and dead cysts was made on the fecal specimens used in the test, the results of the test are not to be interpreted as showing a mortality from drying, as the number shown as dead in the tabulation may have been dead in the original specimen.

One drop of the emulsion was placed toward each end of the glass slide. The drop on one end was spread out with a wooden applicator stick to permit drying, while that at the other end served as a control, not being spread

It was found, as shown in the following table, that the emulsion did not dry nearly so quickly as on the fingers; only after about 10 minutes was the spread quite dry The counts were as follows:

	Test (spread)				Control (not spread)			
	Small cyst		Large cyst		Small cyst		Large cyst	
	Living	Dead	Living	Dead	Living	Dead	Living	Dead
2 minutes after spreading	7	1	2		10		3	
5 minutes after spreading	9		2		8			
7 minutes after spreading	11	2	1	2	9	1	2	
10 minutes after spreading	2	4	1	3	10		5	
15 minutes after spreading	3	14		5	12		1	3

Experiment 9 (Mar. 6, 1934).—This experiment was carried out in the same manner as was the preceding one, save that small drops were spread out on a larger surface with the object of promoting rapid drying. The results are shown below

	Test (spread)				Control (not spread)			
	Small cyst		Large cyst		Small cyst		Large cyst	
	Living	Dead	Living	Dead	Living	Dead	Living	Dead
2 minutes after spreading	6	4	4		14	4	1	1
5 minutes after spreading	2	11	1	6	15	1	4	
7 minutes after spreading	4	11	1	4	16	1	3	
10 minutes after spreading	3	11		6	17		2	1
15 minutes after spreading	2	10		8	17		3	

Experiment 10 (Mar. 6, 1934).—In the next experiment a comparison was made between the times of drying required to kill when the material, a fecal emulsion 9 days old containing the large variety of cysts, was dried on the hand and on a dry rubber glove on the hand. The counts are shown in the following tabulation: [2]

	On the hand		On rubber glove on the hand	
	Living	Dead	Living	Dead
3 minutes after spreading	5	4	5	
5 minutes after spreading		2	1	5
7 minutes after spreading		8	1	8
10 minutes after spreading		12		4
15 minutes after spreading		9		9

[2] It was noted that the emulsion on the hand dried before that on the rubber glove.

Experiment 11 (Mar. 7, 1934).—In this experiment a fresh stool specimen one half hour old, containing blood and mucus, with many motile forms (trophozoites), from an active clinical case of dysentery was employed. The individual had had symptoms of dysentery for about 2 months.

The object here was to determine whether, under the conditions of the experiment, the motile forms (trophozoites) were as readily destroyed by drying as had been believed. The specimen on the fingers dried in about 3 minutes, the mucous flakes remaining moist rather longer than the remainder of the preparation.

The preparations were made after complete drying and at the intervals shown in the following tabulation: [3]

	Live	Dead
1 minute after drying	24	9
2 minutes after drying	None	Many
3 minutes after drying	None	Many
5 minutes after drying	None	Many
10 minutes after drying	None	Many

Experiment 12 (Mar. 7, 1934).—There was available for this experiment a 40-hour-old culture of *Endamoeba histolytica* growing on Williamson's liver infusion agar, overlaid with a sterile mixture of Wassermann-negative human serum and saline in the proportion 1:6. The culture had been transferred every 48 hours for several months. The cultures contained many motile forms (trophozoites), a few precystic forms, and a very few cysts.

The number of organisms found in the saline suspension after the culture had been dried on the hand was so small that counts were unsatisfactory, though all to be found in each preparation were enumerated. The following table gives the counts:

		Living	Dead			Living	Dead
1 minute after spreading	m	4	3	5 minutes after spreading	m		4
	p	1	------		p		------
	c		------		c		------
2 minutes after spreading	m	1	1	10 minutes after spreading	m		6
	p	4	1		p		------
	c		1		c		------
3 minutes after spreading	m		4	Control	m	6	------
	p	1	------		p	15	------
	c		1		c		------

m=Motile forms. p=Precyst forms. c=Cysts.

Experiment 13 (Mar. 8, 1934).—The stool available was about 6 hours old, and came from a clinically active case of dysentery. It contained a moderate number of cyst forms, both large and small,

[3] In all tests in which motile forms (trophozoites) were used, the suspensions were made in 0.85 saline, as distilled water in the preparations was found unsuitable.

and a few in the precyst stage. The patient had had recurrences of symptoms of amoebic dysentery for 8 months, and had been given treatment

The results of the count at the end of the experiment, in which the fecal matter was spread on the hands, are as follows:

	Large		Small	
	Living	Dead	Living	Dead
3 minutes after spreading	11	1	9	0
5 minutes after spreading	.....	9	3	4
7 minutes after spreading	.....	4	1	4
10 minutes after spreading	.....	4	.....	2
Control (kept moist)	20	1	14	4

Experiment 14 (Mar. 9, 1934)—A 4-hour-old soft-stool specimen was available for this test It came from a case with mild clinical symptoms of amoebic dysentery that had been treated with amoebicides. No blood was visible, but there was some mucus, and on microscopic examination many cysts of *E. histolytica* of the small variety were seen.

The undiluted specimen was used for smearing the fingers and thumb. The results are shown in the following table.

	Live	Dead		Live	Dead
2 minutes after smearing	26	23	8 minutes after smearing	3	115
4 minutes after smearing	5	10	10 minutes after smearing	1	20
6 minutes after smearing	3	55	Control (undried material)	68	3

This test was varied, using the same material in the same manner but with the specimen 7 hours old and with a change in time intervals after smearing. The results were as follows:

	Live	Dead
2 minutes after smearing	143	54
3 minutes after smearing	11	59
4 minutes after smearing	6	65
5 minutes after smearing	1	107
7 minutes after smearing	.....	34
Control	112	13

COMMENT

The conditions of the experiments provided for a fouling of the hands far in excess of any that would be likely to occur under ordinary conditions, even with the most untidy or willfully careless carrier. Nevertheless, the number of cysts of *Endamoeba histolytica* to survive beyond 5 minutes was very small in proportion to those killed, and it was exceptional that any survived beyond 10 minutes.

THE AMERICAN DOG TICK, DERMACENTOR VARIABILIS, AS A HOST OF BACTERIUM TULARENSE [1]

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In 1924, Parker, Spencer, and Francis reported the recovery of *Bacterium tularense* from Rocky Mountain wood ticks, *Dermacentor andersoni*, in nature, and from experimentally infected rabbit ticks, *Haemaphysalis leporis-palustris*. They also showed experimental transmission by the various stages of the former species. Since that time, experimental data and accumulating information of human infection have shown the importance of tick-borne tularaemia. Natural infection in ticks of the following species has been reported: *H. leporis-palustris* (Parker and Spencer, 1927); the Pacific coast tick, *D. occidentalis* (Parker, Brooks, and Marsh, 1929), the American dog tick, or sometimes called the eastern wood tick, *D. variabilis* (Green, 1931); and the bird tick, *H. cinnabarina* (Parker, Philip, and Davis, 1932).

The wide distribution of *D. variabilis* within that part of North America in which tularaemia occurs naturally and its record as a human pest make this species of potential importance as a vector of the disease over a considerable area. Hanson and Green (1929) have reported a case associated with tick bite in Hubbard County, Minnesota. Belote (1931), reporting a case in Michigan with primary ulcer on the abdominal wall, states: "Wood ticks cannot be ruled out as a possible source of the infection." *D. variabilis* is the tick of importance as a parasite of man in both these States. A number of "tick-bite" cases have also occurred in the southeastern and south central States, but the species of tick or ticks concerned are uncertain. Francis (1927) stated that "Tick-bite has caused 17 cases in Arkansas, Oklahoma, Texas, Louisiana, and Tennessee", and he now states that by 1933, tick-bite cases in southern States have increased from 17 to 58, and the States named have been increased by the addition of Virginia, North Carolina, Georgia, Missouri, Kansas, and Illinois. Kerlin (1929) reported 3, and possibly 4, cases due to tick bite in Louisiana. *D. variabilis* and *Amblyomma americanum* (the lone star tick) are the species of ticks commonly attacking man in most parts of the region concerned.

In consideration of the above facts, tests of transmission of *Bact. tularense* were undertaken with both species of ticks. Each has proved to be an efficient experimental vector. Only the results of tests with *D. variabilis* are reported in this paper, however.

[1] Contribution from the Rocky Mountain Spotted Fever Laboratory of the United States Public Health Service at Hamilton, Mont.

EXPERIMENTATION

Lots 10901 to 10904.—In May 1929 adult *D. variabilis* were received from Dr. W. A. Riley, of the University of Minnesota. These were fed on tularaemia-infected rabbits. Results of test feedings of progeny of these adults on guinea pigs and rabbits were negative or inconclusive, and the lots were discontinued.

Lot 12901.—On June 29, 1931, rabbit 6744 was infested with larvae from engorged adults forwarded by Dr. C. M. Pierce of Chadron, Nebr., in May. On the next day, the animal was inoculated dermally from the spleen of an infected guinea pig. July 6 (one week after infestation), the engorged larvae were recovered and the rabbit was sacrificed. Typical gross lesions of tularaemia were noted in the spleen and liver.

On July 29 normal guinea pig 34020 was infested with nymphs reared from the above larvae. Seven days later 22 engorged nymphs were recovered. On the ninth day after infestation the host animal was found dead and 4 more engorged nymphs were obtained. Typical gross lesions of tularaemia were observed at necropsy. Guinea pig 34021 was infested with another group of nymphs from the abovementioned larvae and a total of 49 became engorged. This animal died on the eighth day and revealed characteristic lesions of the disease.

On August 5, one engorged nymph that fed on the former of the above-mentioned guinea pigs and 2 that fed on the latter pig were inoculated separately into guinea pigs 34115, 34116, and 34117. Two of these died on the fourth day and the other on the sixth day, all showing typical gross lesions of tularaemia at necropsy.

On October 15, 20, and 26, adult *D. variabilis* reared at room temperature from the nymphs of the above 2 test feedings, were placed on guinea pigs 35514 and 35515, respectively. Twelve and fifteen days later the ticks were removed in a poorly fed condition and stored at room temperature. The first guinea pig died on November 11, 26 days after infestation. No evidence of tularaemia was observed at necropsy. Owing to considerable post mortem change, the cause of death was uncertain and no transfer was made. The other test animal (35515) died of pneumonia on November 3, 18 days after infestation, with no gross evidence of tularaemia. However, spleen tissue transferred subcutaneously to a normal guinea pig caused death on the third day, the necropsy findings being typical.

On October 31, 5 of the poorly fed adults from each of guinea pigs 35514 and 35515, referred to above, were eviscerated and their tissues injected into guinea pigs 35517 and 35598, respectively. No. 35517 showed no reaction and was killed on the eleventh day, revealing no

evidence of tularaemia at necropsy. No. 35598 died in 3 days of pneumonia. Spleen transfer, however, to guinea pig 35765 resulted in typical infection fatal in 3 days, and a pure culture of *Bact tularense* was obtained from heart blood taken just before death

The remainder of these adult ticks were placed on guinea pigs 36204 and 36205 on November 30. No perceptible reaction had occurred by January 6, 1932, and the animals were discarded. The tests of these lots were discontinued because of poor feeding

Lot 14301.—The original stock for this lot consisted of unfed adults received from Dr. R. G. Green, Lake Alexander, Minn., in June 1932 Guinea pig 44001 was infested with 13 males and 21 females on September 6, 1932, This animal was then inoculated dermally on September 10, and died 4 days later with typical gross lesions. A total of 26 engorged females were recovered and placed over damp sand at room temperature for oviposition.

Two normal guinea pigs, 44931 and 44933, were each injected intraperitoneally with about 100 eggs from 2 different females of this lot without producing any apparent reaction over an observation period of 25 days. However, inoculation of the viscera of 3 partly fed adults of the same lot was fatal in 5 days to guinea pig 44129. Necropsy findings were typical, proving that opportunity of ingesting *Bact. tularense* had been provided the adults of this lot.

Groups of larvae reared from several of the above-mentioned female ticks were infested on 6 guinea pigs, 1 domestic rabbit, and 1 native white-footed mouse (*Peromyscus maniculatus artemisiae*) on November 21 and December 2. The mouse died in 3 days without evident lesions, and no transfer was attempted. (Death may have been due to tularaemia. See duplicate test, lot 14302.) The rabbit was bled and killed on the thirteenth day. No suggestive lesions were observed at necropsy, and a negative agglutination test for *Bact. tularense* was obtained with the blood. The guinea pigs showed no reactions during periods of 19 to 47 days and, when killed, revealed no evidence of tularaemia.

Tests of this lot were discontinued.

Lot 14302.—Original stock of *D. variabilis* adults were from the same source as the preceding. Conditions of infection, using guinea pig 44002, were exactly the same. Fifteen male and 21 female ticks were applied on September 6. Dermal inoculation of the host was made 4 days later, death resulting in another 4 days. Sixteen fully engorged females were recovered during the 2 days preceding the death of the host animal, and were segregated for subsequent testing. The guinea pig showed typical gross lesions at necropsy.

Each of two normal guinea pigs, 44932 and 45459, were injected with approximately 100 eggs, each group of eggs being from a different

female tick recovered at death of guinea pig 44002. Periods of 25 and 45 days elapsed without observed reaction, and when the animals were killed no evidence of tularaemia was discerned.

Seven guinea pigs, 2 rabbits, and 1 white-footed mouse were infested with different groups of larvae from several of the above-mentioned female ticks. The guinea pig tests were all negative, as in the preceding experiment, and the injection of pooled engorged larvae from these animals was likewise without result. The rabbit tests were also negative, both by agglutination (blood drawn on the thirteenth and twenty-fifth days) and at necropsy when killed On the other hand, positive results in guinea pigs followed tissue transfer in series from the mouse, which died without evident lesions on the fifth day after infestation. Transfer by spleen of this mouse resulted in acute peritonitis, fatal within 24 hours; that by lung tissue caused death of another animal on the second day, again without definite lesions. Transfer from the latter animal, dermally by spleen and subdermally by spleen and liver, was made to three guinea pigs These died on the fourth and fifth days, and necropsy revealed typical lesions. Pure cultures of *Bact. tularense* were isolated from heart blood drawn while the animals were moribund.

Sixteen partially fed larvae from the above mouse were macerated and inoculated into 2 additional guinea pigs. These animals were moribund 8 days later, and at that time pure cultures of *Bact. tularense* were obtained from heart blood. Both died the next day and typical gross lesions were noted. Dermal transfers by spleen to two other animals caused typical infections, fatal in 5 days.

Fifteen nymphs reared from 1 of the 2 above-mentioned rabbits were placed on guinea pig 46465 on December 31. The animal died the eighth day without lesions, and intraperitoneal transfer by spleen injection in series to 2 additional guinea pigs resulted in peritonitis in the second animal. However, 2 partly engorged nymphs inoculated into guinea pig 46792 caused typical infection fatal on the third day. A pure culture of *Bact. tularense* was obtained from heart blood drawn just prior to death of the animal.

Ten, six, and one nymphs from larvae fed on the white-footed mouse were fed on normal guinea pigs 46466, 46692, and 48447, respectively. The first died in 5 days without evidence of tularaemia, and a culture of heart blood when moribund was negative. No. 46692 died of pneumonia on the twelfth day without evidence suggestive of tularaemia in either the spleen or liver. Subcutaneous injection of the spleen into another animal was negative, as was also an agglutination test of the heart blood drawn on the twenty-sixth day. The lone nymph was dead on the third guinea pig *in situ* on the fourth day, and the animal died on the ninth day without evident cause of death. Spleen

transfer, intraperitoneally, was without result, and heart blood of the twenty-third day contained no specific agglutinins. However, intraperitoneal inoculation of an emulsion of 5 partly fed nymphs from 46692 (4 of which were dead and the other dying *in situ*) caused the death of guinea pigs 47246 and 47247 in 5 days; necropsy findings were characteristic, and heart blood of each, drawn just prior to death, yielded pure cultures of *Bact. tularense.* Transfer by spleen dermally from one of the above-mentioned animals also produced typical infection, fatal on the fifth day

Lot 14305.—To confirm "hereditary transmission", a group of adults received from Ono, Calif , on June 14, 1933, as partially engorged females from a dog, were placed on guinea pig 52625 two days after dermal inoculation This animal died on the fifth day (3 days after infestation), and 4 nearly engorged females were segregated for oviposition. On August 3, about 100 eggs from each of 2 ticks were washed thoroughly in distilled water and injected intraperitoneally into separate normal guinea pigs, 53544 and 53545. These test animals died in 4 and 3 days, respectively, showing characteristic gross lesions of tularaemia at necropsy Heart blood of the first yielded a pure culture of *Bact. tularense* and a spleen transfer dermally to a second animal was fatal in 6 days, typical gross lesions being present in both animals.

COMMENT

It is seen that stage to stage and generation to generation transmission of *Bact. tularense* in *D. variabilis* can be demonstrated experimentally, but may not be constant.

In one series of tests, hereditary continuity of infection was shown only in those larvae fed on a mouse, although two rabbits and several guinea pigs were exposed to the bites of the same larval lots. However, further evidence of hereditary transfer was supplied by positive results following the injection of separate guinea pigs with washed eggs of two infected ticks.

It is also seen that some of the nymphs of lot 14302 and adults of lot 12901 proved to contain *Bact. tularense* by later injection, did not transmit infection while feeding (for a period as long as 10 days in in the case of animal 46692, lot 14302), part of the infected ticks dying while only partially engorged and still attached to the host.

The death of ticks engorging or engorged on tularaemia-infected hosts has not infrequently been observed with *D. variabilis*, especially among ovulating females which had not detached until death of the donor guinea pig of tularaemia or among the progeny of such females. This may have some connection with the fact that in other tularaemia studies made at this laboratory it has been noted that bacteraemia

in infected guinea pigs is most intense just prior to death. Because of this unusual mortality, continuous lines of tularaemia-infected ticks have frequently been difficult to maintain. The most successful procedure has been to remove attached ticks before the death of the host and to replace them on a normal animal whenever further engorgement is necessary.

This apparent deleterious effect of *Bact. tularense*, as well as the failure of some infected ticks to transfer infection while feeding, has been encountered also in tests of tularaemia transmission with other species of ticks. No comparable loss has been encountered in non-infected experimental ticks stored and fed under similar conditions.

The recovery of the bacterium from *H. cinnabarina* dead *in situ* on a recently dead sage hen in nature was reported by Parker, Philip, and Davis (1932).

The observations noted above suggest that *Bact. tularense* is not completely adapted to continued residence through successive stages of its host ticks. Nevertheless, the role of ticks in the dissemination of the disease among susceptible animals and to man is well established.

The importance and distribution of *D. variabilis* as a parasite of man is discussed elsewhere by Parker, Philip, and Jellison, 1933. While in areas where this tick is indigenous, the most frequent avenue of human infection with tularaemia is direct contact with infected animals, particularly rabbits, yet the possibility of infection by *D. variabilis* must be kept in mind, particularly if the case history fails to give evidence of animal handling.

SUMMARY

The American dog tick, *D. variabilis*, was experimentally infected with *Bact. tularense* in the adult stage and in the larval stage. Larvae from the above adults fatally infected a white-footed mouse. Resultant engorging nymphs were shown to contain virulent organisms, which, in some instances, apparently caused the death of the ticks *in situ;* however, demonstrable infection was not produced in some of the host animals. Further evidence of generation to generation continuity of *Bact. tularense* in this tick was secured by the injection of partial batches of eggs from two additional infected ticks.

Nymphs reared from infected larvae produced fatal infections in two guinea pigs. Infection was produced by resultant adults in separate guinea pigs both by feeding and by injection.

Tests with this and other species of ticks (to be reported) suggest that *Bact. tularense* is not entirely adapted to continued residence in ticks through their developmental cycle, since the ticks themselves

sometimes die (apparently as a result of the presence of this organism) while still attached to the host animal and occasionally without infecting such host.

Since (1) larval-to-adult and adult-to-progeny continuity of infection has been demonstrated, (2) recovery of infected ticks in nature has been reported, and (3) cases of human infection apparently associated with bites of this species have occurred, *D variabilis* must be kept in mind as a possible source of human infection, especially where case histories fail to show evidence of animal contacts.

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MOST PROBABLE NUMBERS FOR EVALUATION OF COLI-AEROGENES TESTS BY FERMENTATION TUBE METHOD

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In a previous publication (1) a procedure was presented for computation of the most probable number of *coli-aerogenes* organisms from results of the fermentation tube method of bacteriological analysis of water. Employing this procedure has expedited the computation of most probable numbers corresponding to analytical results possible to be obtained from a wide variety of combinations of portions of sample planted at various dilutions Such computed values are presented in the accompanying tabulations for the combinations of tubes most likely to be employed in routine water, sewage, and milk analyses. All values are given in organisms per hundred cubic centimeters of sample and are correct to two significant figures.

Most probable number (M P.N.) values in heavy face type are those corresponding to the analytical results in which no "skips" or apparent inconsistencies occur. Tables 1-A and 1-B comprise values for the results of various combinations of tubes to a total of seven tubes in as many as three dilutions. Table 2 contains the most probable numbers for combinations in which 3, 4, or 5 tubes are planted in each of three dilutions in geometric series, while tables 3-A, 3-B, and 3-C are the most probable number values corresponding to all possible combinations of a total of five tubes when planted in not more than three dilutions in the series 10—1—0.1 cc, 50—10—1 cc, and 100—50—10 cc, respectively.

TABLE 1-A.—*Most probable numbers per 100 cc of sample, planting various portions in not more than 3 dilutions*

Number of positive tubes in dilutions	Combinations of portions planted in cubic centimeters												
Low Mid High	1-10 1-1 1-0 1	1-10 5-1 1-0 1	2-10 1-1	2-10 1-1 1-0 1	2-10 2-1 2-0 1	1-50 1-10 1-1	1-50 5-10 1-1	2-50 1-10 1-1	2-50 2-10 2-1	1-100 1-50 1-10	1-100 5-50 1-10	2-100 1-50 1-10	2-100 2-50 2-10
0 0 1	9 0	6 7	------	4 7	4 5	1 7	1 0	0 90	0 83	0 65	0 28	0 39	0 32
0 0 2	------	------	------	------	9 0	------	------	------	1 7	------	------	------	64
0 1 0	9 4	6 8	4 9	4 9	4 6	1 8	1 0	94	86	75	30	43	34
0 1 1	19	14	------	9 7	9 2	3 6	2 1	1 9	1 7	1 6	61	.88	69
0 1 2	------	------	------	------	14	------	------	------	2 6	------	------	------	1 1
0 2 0	------	14	------	------	9 4	------	2 2	------	1 8	------	65	------	75
0 2 1	------	21	------	------	14	------	3 3	------	2 7	------	1 0	------	1 2
0 2 2	------	------	------	------	19	------	------	------	3 6	------	------	------	1 6
0 3 0	------	22	------	------	------	------	3 5	------	------	------	1 1	------	------
0 3 1	------	30	------	------	------	------	4 7	------	------	------	1 5	------	------
0 4 0	------	31	------	------	------	------	5 0	------	------	------	1 6	------	------
0 4 1	------	39	------	------	------	------	6 4	------	------	------	2 1	------	------
0 5 0	------	40	------	------	------	------	6 8	------	------	------	2 4	------	------
0 5 1	------	49	------	------	------	------	8 3	------	------	------	3 0	------	------
1 0 0	23	11	6 5	6 4	6 0	3 4	1 4	1 3	1 1	98	33	49	37
1 0 1	95	24	------	13	12	9 9	2.9	2 5	2 2	2 3	67	1 0	77
1 0 2	------	------	------	------	19	------	------	------	3 4	------	------	------	1 2
1 1 0	240	26	14	14	13	24	3 1	2 7	2 3	4 0	72	1 2	.85
1 1 1	------	45	------	22	20	------	4.9	4 2	3 6	------	1 1	1 9	1 3
1 1 2	------	------	------	------	28	------	------	------	4 9	------	------	------	1.8
1 2 0	------	51	------	------	21	------	5 5	------	3 8	------	1 2	------	1 5
1 2 1	------	76	------	------	29	------	7 9	------	5 3	------	1.7	------	2 1
1 2 2	------	------	------	------	37	------	------	------	6 9	------	------	------	2 8
1 3 0	------	89	------	------	------	------	9 0	------	------	------	1 9	------	------
1 3 1	------	120	------	------	------	------	12	------	------	------	2 6	------	------
1 4 0	------	150	------	------	------	------	15	------	------	------	3 1	------	------
1 4 1	------	210	------	------	------	------	21	------	------	------	4 1	------	------
1 5 0	------	390	------	------	------	------	39	------	------	------	6 5	------	------
2 0 0	------	------	30	30	23	------	------	4 6	3 4	------	------	1 5	98
2 0 1	------	------	------	95	50	------	------	11	6 1	------	------	2 6	1 6
2 0 2	------	------	------	------	95	------	------	------	10	------	------	------	2 3
2 1 0	------	------	------	240	62	------	------	24	7 3	------	------	4 1	1 9
2 1 1	------	------	------	------	130	------	------	------	13	------	------	------	2 8
2 1 2	------	------	------	------	210	------	------	------	21	------	------	------	4 1
2 2 0	------	------	------	------	240	------	------	------	24	------	------	------	4 0
2 2 1	------	------	------	------	700	------	------	------	70	------	------	------	8 1

Table 2—*Most probable numbers per 100 cc of sample, planting 3, 4, or 5 portions in each of 3 dilutions in geometric series*

Number of positive tubes			Combinations of tubes planted			Number of positive tubes			Combinations of tubes planted			Number of positive tubes			Combinations of tubes planted		
10 cc	1 cc	0.1 cc	3-10 3-1 3-0.1	4-10 4-1 4-0.1	5-10 5-1 5-0.1	10 cc	1 cc	0.1 cc	3-10 3-1 3-0.1	4-10 4-1 4-0.1	5-10 5-1 5-0.1	10 cc	1 cc	0.1 cc	3-10 3-1 3-0.1	4-10 4-1 4-0.1	5-10 5-1 5-0.1
0	0	0	—	—	—	1	0	0	3.6	2.6	2.0	2	0	0	9.1	6.0	4.5
0	0	1	3.0	2.3	1.8	1	0	1	7.2	5.1	4.0	2	0	1	14	9.1	6.8
0	0	2	6.0	4.5	3.6	1	0	2	11	7.8	6.0	2	0	2	20	12	9.1
0	0	3	9.0	6.8	5.4	1	0	3	15	10	8.0	2	0	3	26	16	12
0	0	4	—	9.0	7.2	1	0	4	—	13	10	2	0	4	—	19	14
0	0	5	—	—	9.0	1	0	5	—	—	12	2	0	5	—	—	16
0	1	0	3.0	2.3	1.8	1	1	0	7.3	5.2	4.0	2	1	0	15	9.3	6.8
0	1	1	6.1	4.6	3.6	1	1	1	11	7.9	6.1	2	1	1	20	13	9.2
0	1	2	9.2	6.8	5.5	1	1	2	15	11	8.1	2	1	2	27	16	12
0	1	2	12	9.1	7.3	1	1	3	19	13	10	2	1	3	34	20	14
0	1	4	—	11	9.1	1	1	4	—	16	12	2	1	4	—	23	17
0	1	5	—	—	11	1	1	5	—	—	14	2	1	5	—	—	19
0	2	0	6.2	4.6	3.7	1	2	0	11	8.0	6.1	2	2	0	21	13	9.3
0	2	1	9.3	6.9	5.5	1	2	1	15	11	8.2	2	2	1	28	16	12
0	2	2	12	9.2	7.4	1	2	2	20	13	10	2	2	2	35	20	14
0	2	3	16	12	9.2	1	2	3	24	16	12	2	2	3	42	24	17
0	2	4	—	14	11	1	2	4	—	19	15	2	2	4	—	28	19
0	2	5	—	—	13	1	2	5	—	—	17	2	2	5	—	—	22
0	3	0	9.4	7.0	5.6	1	3	0	16	11	8.3	2	3	0	29	17	12
0	3	1	13	9.3	7.4	1	3	1	20	14	10	2	3	1	36	20	14
0	3	2	16	12	9.3	1	3	2	24	16	13	2	3	2	44	24	17
0	3	3	19	14	11	1	3	3	29	19	15	2	3	3	53	28	20
0	3	4	—	16	13	1	3	4	—	22	17	2	3	4	—	32	22
0	3	5	—	—	15	1	3	5	—	—	19	2	3	5	—	—	25
0	4	0	—	9.4	7.5	1	4	0	—	14	11	2	4	0	—	21	15
0	4	1	—	12	9.4	1	4	1	—	17	13	2	4	1	—	25	17
0	4	2	—	14	11	1	4	2	—	20	15	2	4	2	—	29	20
0	4	3	—	17	13	1	4	3	—	23	17	2	4	3	—	33	23
0	4	4	—	19	15	1	4	4	—	26	19	2	4	4	—	37	25
0	4	5	—	—	17	1	4	5	—	—	22	2	4	5	—	—	28
0	5	0	—	—	9.4	1	5	0	—	—	13	2	5	0	—	—	17
0	5	1	—	—	11	1	5	1	—	—	15	2	5	1	—	—	20
0	5	2	—	—	13	1	5	2	—	—	17	2	5	2	—	—	23
0	5	3	—	—	15	1	5	3	—	—	19	2	5	3	—	—	26
0	5	4	—	—	17	1	5	4	—	—	22	2	5	4	—	—	29
0	5	5	—	—	19	1	5	5	—	—	24	2	5	5	—	—	32

Table 3-A—*Most probable numbers per 100 cc of sample, planting 5 portions in not more than 3 dilutions*

Number of positive tubes			Combinations of 10, 1, and 0 1 cc portions planted										
10 cc	1 cc	0 1 cc	0-0-5	0-1-4	0-2-3	0-3-2	0-4-1	1-1-3	1-2-2	1-3-1	2-1-2	2-2-1	3-1-1
0	0	1	220	74	45	32	25	9 0	8 3	7.7	4 7	4 5	3 2
0	0	2	510	150	91	65	-------	17	17	-------	9 5	-------	-------
0	0	3	920	240	140	-------	-------	27	-------	-------	-------	-------	-------
0	0	4	1, 600	340	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	1	0	-------	130	57	38	28	9 3	8 6	7 9	4 8	4 6	8 3
0	1	1	-------	330	120	77	57	19	17	16	9 7	9 3	6 5
0	1	2	-------	700	190	120	-------	28	26	-------	15	-------	-------
0	1	3	-------	1, 400	280	-------	-------	38	-------	-------	-------	-------	-------
0	2	0	-------	-------	200	98	67	-------	18	17	-------	9 5	-------
0	2	1	-------	-------	450	160	100	-------	27	25	-------	14	-------
0	2	2	-------	-------	1, 100	230	-------	-------	36	-------	-------	-------	-------
0	3	0	-------	-------	-------	280	130	-------	-------	26	-------	-------	-------
0	3	1	-------	-------	-------	710	190	-------	-------	35	-------	-------	-------
0	4	0	-------	-------	-------	-------	370	-------	-------	-------	-------	-------	-------
1	0	0	-------	-------	-------	-------	-------	22	17	14	6.4	6 0	3.9
1	0	1	-------	-------	-------	-------	-------	80	48	36	13	12	7 9
1	0	2	-------	-------	-------	-------	-------	170	95	-------	21	-------	-------
1	0	3	-------	-------	-------	-------	-------	260	-------	-------	-------	-------	-------
1	1	0	-------	-------	-------	-------	-------	150	61	42	14	13	8 0
1	1	1	-------	-------	-------	-------	-------	430	130	81	21	20	12
1	1	2	-------	-------	-------	-------	-------	1, 100	210	-------	30	-------	-------
1	2	0	-------	-------	-------	-------	-------	-------	240	100	-------	21	-------
1	2	1	-------	-------	-------	-------	-------	-------	700	170	-------	29	-------
1	3	0	-------	-------	-------	-------	-------	-------	-------	340	-------	-------	-------
2	0	0	-------	-------	-------	-------	-------	-------	-------	-------	29	24	10
2	0	1	-------	-------	-------	-------	-------	-------	-------	-------	87	52	16
2	0	2	-------	-------	-------	-------	-------	-------	-------	-------	180	-------	-------
2	1	0	-------	-------	-------	-------	-------	-------	-------	-------	180	66	17
2	1	1	-------	-------	-------	-------	-------	-------	-------	-------	700	140	24
2	2	0	-------	-------	-------	-------	-------	-------	-------	-------	-------	300	-------
3	0	0	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	33
3	0	1	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	95
3	1	0	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	240

TABLE 3-B.—*Most probable numbers per 100 cc of sample, planting 5 portions in not more than 3 dilutions*

Number of positive tubes			Combinations of 50, 10, and 1 0 cc portions planted											
50 cc	10 cc	1 cc	0-5-0	1-1-3	1-2-2	1-3-1	1-4-0	2-1-2	2-2-1	2-3-0	3-1-1	3-2-0	4-1-0	5-0-0
0	0	1	-------	1 6	1 4	1 2	-------	0 90	0 83	-------	0 62	-------	-------	-------
0	0	2	-------	3 2	2 8	-------	-------	1 8	-------	-------	-------	-------	-------	-------
0	0	3	-------	4 9	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	4	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	1	0	2 2	1 7	1 5	1 3	1 2	94	86	0 80	64	0 61	0 49	-------
0	1	1	-------	3 5	3 0	2 7	-------	1 9	1 7	-------	1 3	-------	-------	-------
0	1	2	-------	5 3	4 6	-------	-------	2 8	-------	-------	-------	-------	-------	-------
0	1	3	-------	7 2	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	2	0	5 1	-------	3 3	2 8	2 5	-------	1 8	1 7	-------	1 3	-------	-------
0	2	1	-------	-------	4 9	4 3	-------	-------	2 7	-------	-------	-------	-------	-------
0	2	2	-------	-------	6 7	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	3	0	9 2	-------	-------	4 6	4 1	-------	-------	2 6	-------	-------	-------	-------
0	3	1	-------	-------	-------	6 3	-------	-------	-------	-------	-------	-------	-------	-------
0	4	0	16	-------	-------	-------	5 9	-------	-------	-------	-------	-------	-------	-------
1	0	0	-------	3 2	2 4	1 9	1 6	1 2	1.1	97	74	70	54	0 44
1	0	1	-------	8 5	5 5	4 2	-------	2 5	2 2	-------	1 5	-------	-------	-------
1	0	2	-------	17	9 7	-------	-------	3 8	-------	-------	-------	-------	-------	-------
1	0	3	-------	26	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
1	1	0	-------	15	6 8	4 8	3 8	2 6	2 3	2 1	1 6	1 5	1 1	-------
1	1	1	-------	43	13	8 3	-------	4.1	3 6	-------	2 4	-------	-------	-------
1	1	2	-------	110	21	-------	-------	5.7	-------	-------	-------	-------	-------	-------
1	2	0	-------	-------	24	11	7 3	-------	3 9	3 4	-------	2 3	-------	-------
1	2	1	-------	-------	70	17	-------	-------	5 4	-------	-------	-------	-------	-------
1	3	0	-------	-------	-------	34	14	-------	-------	5 1	-------	-------	-------	-------
2	0	0	-------	-------	-------	-------	-------	4 5	3 5	2 9	1 9	1.8	1 3	1 0
2	0	1	-------	-------	-------	-------	-------	9 5	6 3	-------	3 1	-------	-------	-------
2	0	2	-------	-------	-------	-------	-------	18	-------	-------	-------	-------	-------	-------
2	1	0	-------	-------	-------	-------	-------	18	7 6	5 6	3 2	2 9	2.0	-------
2	1	1	-------	-------	-------	-------	-------	70	14	-------	4 6	-------	-------	-------
2	2	0	-------	-------	-------	-------	-------	-------	30	11	-------	4 3	-------	-------
3	0	0	-------	-------	-------	-------	-------	-------	-------	-------	5 4	4 3	2 5	1 8
3	0	1	-------	-------	-------	-------	-------	-------	-------	-------	10	-------	-------	-------
3	1	0	-------	-------	-------	-------	-------	-------	-------	-------	24	8 3	3.7	-------
4	0	0	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	6.1	3 9

TABLE 3-C.—*Most probable numbers per 100 cc of sample, planting 5 portions in not more than 3 dilutions*

Number of positive tubes			Combinations of 100, 50, and 10 cc portions planted											
100 cc	50 cc	10 cc	0-5-0	1-1-3	1-2-2	1-3-1	1-4-0	2-1-2	2-2-1-	2-3-0	3-1-1	3-2-0	4-1-0	5-0-0
0	0	1	-------	0 57	0 47	0 39	-------	0 38	0 33	-------	0 28	-------	-------	-------
0	0	2	-------	1 2	.95	-------	-------	77	-------	-------	-------	-------	-------	-------
0	0	3	-------	1 8	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	0	4	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	1	0	0 44	65	52	43	0 36	41	35	0 31	30	0 27	0 24	-------
0	1	1	-------	1 4	1 1	88	-------	84	72	-------	61	-------	-------	-------
0	1	2	-------	2 1	1 7	-------	-------	1 3	-------	-------	-------	-------	-------	-------
0	1	3	-------	3 0	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	2	0	1 0	-------	1 2	97	81	-------	78	67	-------	58	-------	-------
0	2	1	-------	-------	1 9	1 5	-------	-------	1 2	-------	-------	-------	-------	-------
0	2	2	-------	-------	2 7	-------	-------	-------	-------	-------	-------	-------	-------	-------
0	3	0	1 8	-------	-------	1 7	1 4	-------	-------	1 1	-------	-------	-------	-------
0	3	1	-------	-------	-------	2 4	-------	-------	-------	-------	-------	-------	-------	-------
0	4	0	3 2	-------	-------	-------	2 2	-------	-------	-------	-------	-------	-------	-------
1	0	0	-------	81	61	49	.41	46	39	34	33	.29	25	0 22
1	0	1	-------	1 8	1 3	1 0	-------	97	81	-------	67	-------	-------	-------
1	0	2	-------	3 1	2 1	-------	-------	1 5	-------	-------	-------	-------	-------	-------
1	0	3	-------	4 8	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
1	1	0	-------	2 5	1 5	1 2	93	1 1	89	.75	72	63	.54	-------
1	1	1	-------	5 1	2 6	1 9	-------	1 7	1 4	-------	1 1	-------	-------	-------
1	1	2	-------	11	4 0	-------	-------	2 5	-------	-------	-------	-------	-------	-------
1	2	0	-------	-------	3 8	2 2	1 7	-------	1 6	1 3	-------	1.0	-------	-------
1	2	1	-------	-------	6.0	3 4	-------	-------	2 2	-------	-------	-------	-------	-------
1	3	0	-------	-------	-------	5 6	3 0	-------	-------	2 0	-------	-------	-------	-------
2	0	0	-------	-------	-------	-------	-------	1 4	1 0	.85	81	.69	59	51
2	0	1	-------	-------	-------	-------	-------	2 3	1 7	-------	1 3	-------	-------	-------
2	0	2	-------	-------	-------	-------	-------	3 7	-------	-------	-------	-------	-------	-------
2	1	0	-------	-------	-------	-------	-------	3 3	2 0	1 5	1 4	1 2	.98	-------
2	1	1	-------	-------	-------	-------	-------	7 6	3 1	-------	2 1	-------	-------	-------
2	2	0	-------	-------	-------	-------	-------	-------	5 0	2 7	-------	1 9	-------	-------
3	0	0	-------	-------	-------	-------	-------	-------	-------	-------	1 8	1.4	1 1	92
3	0	1	-------	-------	-------	-------	-------	-------	-------	-------	2 8	-------	-------	-------
3	1	0	-------	-------	-------	-------	-------	-------	-------	-------	4 4	2 4	1 7	-------
4	0	0	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	2 2	1.6

The basic tables of M.P N. values here presented may be expanded to meet a wide variety of combinations of portion plantings. Where such values are desired for any fraction or multiple of the dilution combination given, all that is necessary is to multiply the tabulated M.P.N. values of such combination by the quotient obtained by dividing the lowest dilution amount of the tabulated combination by the fraction or multiple required of this same lowest dilution. Thus, the M.P.N. values under the combination 2–10, 1–1, and 1–0.1 cc may be used to compute the values for the combination 2–100, 1–10, and 1–1 cc by multiplying each of the tabulated M.P.N. values by the common factor $\frac{10}{100}=0.1$; for the combination 2–0.1, 1–0.01, and 1–0.001 cc by using the multiplying factor $\frac{10}{0.1}=100$; or for the combination 2–50, 1–5, and 1–0.5 by using as the multiplier $\frac{10}{50}=0.2$, and so on.

Conversely, the M.P.N. value is the same for any multiple of a combination of portions and its corresponding multiple positive tube value as that given for the combination and positive tube result itself. Thus, the M.P.N. value in the tabulated combination 1–10, 5–1, and 1–0 1 cc where the positive tube result is 1—1—1 is 45 per 100 cc. This M.P.N. value is likewise correct for any multiple of this combination and its corresponding multiple of positive tube results, such as 2–10, 10–1, and 2–0.1 cc where the positive tube result is 2—2—2; for 3–10, 15–1, and 3–0 1 cc where the positive tube result is 3—3—3; and so on. Following this same principle, the tabulated values of the 4–10, 4–1, and 4–0.1 cc, for example, may be used to check the M P N. values of the 1–10, 1–1, and 1–0 1 cc, and the 2–10, 2–1, and 2–0.1 cc combinations which, for convenience, are given in the accompanying tables.

Where all tubes in all dilutions show growth or where all show no growth the result is, of course, indeterminate and no M.P N. value can be computed. All that can be said is that the M.P.N. is greater or less than a certain value which may be computed on the assumption that the next dilution, if it had been planted, would have shown a change from positive to negative, or negative to positive, as the case may be In any extended series of dilutions of a sample, the value of the M.P.N. is determined, practically, by the tubes of the dilutions in which the change is from positive to negative growth. Thus, in the series of dilutions with these results,

100 cc	10 cc	1 cc	0 1 cc	0 01 cc	0 001 cc	0 0001 cc
1+ 0−	2+ 0−	1+ 1−	0+ 2−	0+ 1−	0+ 1−	0+ 1−

the most probable number is defined practically entirely by the results of the 10-, 1-, and 0 1-cc tubes Hence the M.P.N., which is 62 per 100 cc, may be obtained at once from table 1-A under the combination 2–10, 2–1, and 2–0 1 cc and opposite the positive result 2—1—0.

The slight degree to which the value of the M.P.N. is affected by extended dilutions beyond the range of the change from positive to negative tube results, is shown by the following example:

100 cc	50 cc	10 cc	1 cc	0 1 cc	M.P N per 100 cc
		4+ 1−			16
		4+ 1−	1−		15
		4+ 1−	1−	1−	15
		4+ 1−	2−		15
	1+	4+ 1−	1−		15
	1+	4+ 1−			16
1+	1+	4+ 1−			16
1+		4+ 1−			16
1+		4+ 1−	1−		15
1+		4+ 1−	5−	5−	13
5+		4+ 1−	5−		13

The futility of planting tubes in dilutions very far out of the range of this change is clearly indicated.

DISCUSSION

From a study of the M P.N values presented in these tables some conclusions of practical interest may be derived For the purpose of simplifying this discussion, the M.P N. values of "skip" or "inconsistent" analytical results in the various series are disregarded, although such results are entirely rational and any one of them may be

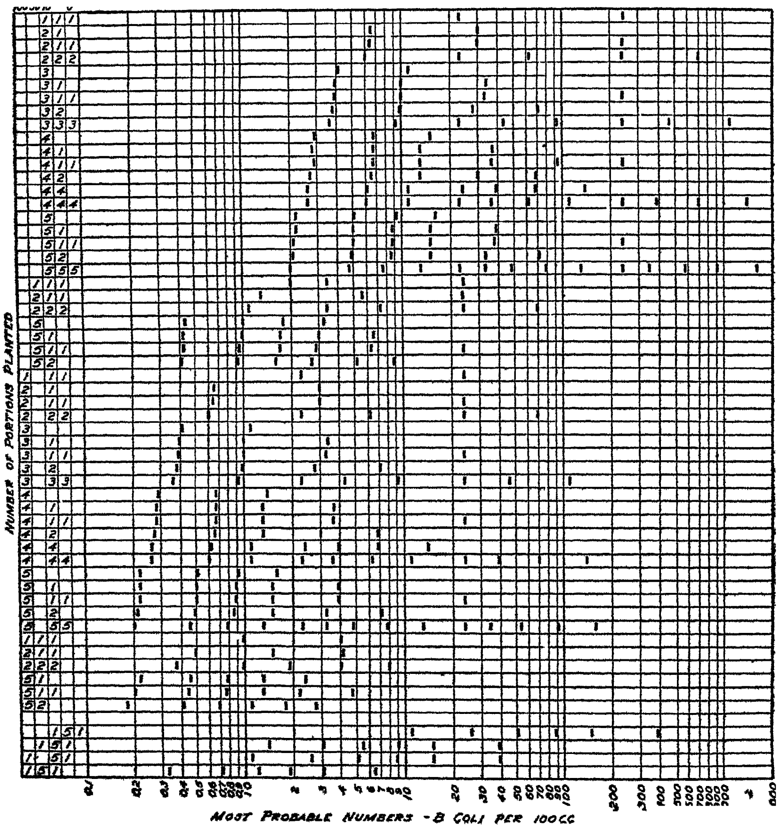

FIGURE 1 —Plot of most probable number values per 100 cc corresponding to analytical results (excluding anomalous or "skip" results) from the liquid media method of determination of the *coli-aerogenes* group, when designated numbers of specified portions of the sample are planted

obtained at intervals of varying frequency. Omitting such results, the M.P.N. values of the various combinations of sample portions presented in heavy type in the tables are plotted in a logarithmic scale in figures 1 and 2.

It will be observed that the lowest M.P.N. values are quite definitely limited by the size of the largest portion planted, are limited to

a lesser degree by the number of portions planted at this dilution, and are changed not at all by an increase in the number of portions of smaller amount than this largest portion Thus, in figure 1, the lowest M.P.N. value obtainable from one 10-cc positive tube, in any series in which 10 cc is the largest portion of sample planted, ranges from 23 per 100 cc, where the series is 1—1—1, to 2 0 per 100 cc in the series 5—5—5. However, increases in the number of portions planted at the various dilutions do tend to measure more accurately the M.P.N. value of the sample within the limits of the range, because

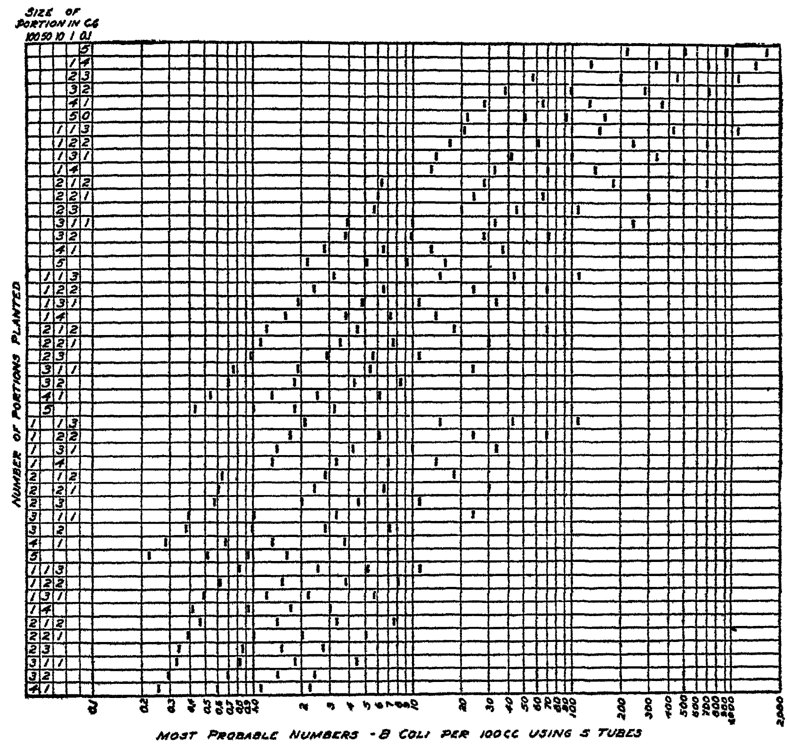

FIGURE 2 —Plot of most probable number values per 100 cc corresponding to analytical results (excluding anomalous or "skip" results) from the liquid media method of determination of the *coli-aerogenes* group when five portions of designated size of the sample are planted

the possible values obtainable within the range are always one less in number than the number of tubes planted. For example, in the series of 1–10, 1–1, and 0.1 cc, only two values are possible (either 23 or 240 per 100 cc), whereas in the series 5–10, 5–1, 5–0.1 cc any one of 14 values between 2.0 and 1,600 per 100 cc are possible, depending upon the combination of positive and negative tube results. Therefore, when the range of bacterial density in the sample under examination can be reasonably estimated, it is advantageous to plant the greater number of portions in the range corresponding to this esti-

mate, rather than equal numbers of portions in an indiscriminate range.

This principle is particularly applicable to the bacteriological analysis of drinking water supplies. Here the upper limit is generally required to conform to the Treasury Department standard of 1.05 *coli-aerogenes* group organisms per 100 cc. Yet no reasonable number of 10-cc portions of a sample examined will measure the content much below two such organisms per 100 cc. In other words, as Reed (2) points out, the measuring stick is too coarse for this particular purpose. Consequently, when 10-cc portions are planted, the water purification plant operator has no means of knowing at any time how closely the bacterial content of the finished water is approaching this upper limit, and his bacteriological test is not of the maximum value to him that it should be. This difficulty can be overcome readily, however, if, instead of 10 cc portions, 100 cc portions of the sample are planted.

As shown by the tables, the range of, for example, five 100-cc tubes will extend from 0.22 to 1.6 organisms per 100 cc; or, if five 50-cc tubes are inoculated, from 0.44 to 3.2 per 100 cc instead of from 2.2 to 16 per 100 cc when five 10-cc tubes are planted. It would appear highly desirable, therefore, to increase the size of the portion examined in order to increase the value of this routine test. Such procedure offers no difficulty in laboratory technique, the only requirement being larger tubes or containers for inoculation, larger quantities of media, and slightly greater incubator space. Double-strength broth—about 75 cc for the 100-cc portion—in the inoculation tube is usually satisfactory.

In routine laboratory work there is usually a definite, practicable limit to the number of tubes that can be examined. It is of particular interest, therefore, that the greatest possible return be obtained from the analytical results. Careful selection of the series of dilutions employed will increase the usefulness of the test and at the same time reduce the volume of routine laboratory work. It may be assumed that, for routine work, five portions of each sample are about all that can be expected to be inoculated. Upon this assumption, all the most probable numbers of all possible series of combinations employing five tubes in not more than three dilutions are presented in tables 3-A, 3-B, and 3-C. In general, a careful selection of the combination from these series will meet most routine requirements. In special cases where the bacterial density of the sample cannot be estimated, planting of one or more portions at each dilution in an extended series is perhaps the preferable procedure and then, for purpose of interpretation, discarding the positive and negative results, excepting only those immediately above and below the point of change in sign. Thus, the series of the 5—1, 5—1—1 or

1—5—1 combinations may be extended by single tubes in geometric series in either higher or lower dilutions and the result readily interpreted by means of the tables, regardless of the dilution in which the change may occur. Figure 1 shows graphically, for example, how the combination 1—5—1 in various dilutions may be adapted to cover the entire range of bacterial density of samples.

To aid the judgment in the selection of the proper combination of portions in water purification practice, experience with the waters dealt with is the best guide. Streeter (3) has shown that for the various stages of the treatment process, comprising coagulation, rapid sand filtration, and chlorination, certain concentrations of *coli-aerogenes* group organisms are about limiting numbers that can be expected to be present if the final effluent is to conform to the Treasury Department standard for drinking water. These limiting numbers are given in the first column of the following summary, opposite which are set down suggested combinations of sample portions for examination which will cover the stated density range:

Water	Limiting concentration M P N per 100 cc	Combination of portions examined	Range measured M P N per 100 cc
Raw water	9,000	2-0.1, 3-0 01 cc.	570 to 11,000
Applied water	3,700	4-0 1, 1-0 01 cc.	280 to 3,700
Filtered water	35	3-100, 2-10 cc.	3 8 to 71
Chlorinated water	1.05	5-100 cc.	0 22 to 1 6

These combinations are given only as an illustration of the selection method. Other combinations in the accompanying tables may be chosen to conform more closely to specific conditions or where it is deemed advisable to extend the range either above or below a certain estimated density of *coli-aerogenes* organisms. In general, where the bacterial density of a water changes little from day to day, a properly selected series employing a total of five portions of sample will meet most routine requirements and afford a well-defined picture of the *coli-aerogenes* content.

REFERENCES

(1) Hoskins, J. K · The most probable numbers of *B. coli* in water analysis. Jour. Am. Water Works Assoc., 25:867-877 (June 1933).

(2) Reed, Lowell J.: Drinking water standards. Appendix III. *B. coli* densities as determined from various types of samples. Pub. Health Rep., 40:693-721 (April 10, 1925). Reprint no. 1029.

(3) Streeter, H. W.: The bacterial efficiency of certain intermediate stages of water treatment. Public Works. 64:17-20 (December 1933).

COURT DECISION ON PUBLIC HEALTH

Conviction for unlawful possession of "mariguana" sustained.—(Utah Supreme Court; *State* v. *Navaro*, 26 P.(2d) 955; decided Nov. 17, 1933.) A Utah statute made it unlawful, among other things, for a person "to have in possession any cocaine, opium, morphine, codeine, heroin, peyote (mescal button), alpha eucaine, beta eucaine, nova caine, flowering tops and leaves, extracts, tinctures, and other narcotic preparations of hemp or loco weed, (cannabis sativa, Indian hemp), mariguana, or chloral hydrate, or any of the salts, derivatives, or compounds of the foregoing substances, or any preparation or compound containing any of the foregoing substances, or their salts, derivatives, or compounds". Under the statute, possession of the drugs named was lawful under certain circumstances, such as, for example, upon the written order or prescription of a physician. The defendant was convicted of unlawfully possessing mariguana. The evidence showed that he was stopped on a public street by two police officers. One of them drew from the defendant's shirt pocket a package containing 10 cigarettes done up in brown papers. The officers testified that the defendant said that the package belonged to him and that it contained mariguana. The defendant denied making such statements. The city chemist of Salt Lake City examined the package's contents and testified that he found that the cigarettes contained American cannabis, or mariguana.

On appeal to the supreme court, the defendant contended that the statute did not prohibit possession of mariguana itself but of the flowering tops and leaves of mariguana, the tincture, extract, or other preparations of mariguana, and that the information, in order to charge an offense under the statute, should have charged unlawful "possession of the flowering tops and leaves of mariguana" instead of directly charging unlawful "possession of marijuana". This view was predicated on the grammatical construction of the pertinent sentence in the statute and on the definition of the word "marijuana", which the defendant claimed meant a plant and not a drug.

The supreme court said that it would seem that "mariguana", when used without qualifying or modifying words, indicated the product or preparation consisting of the flowering tops, leaves, and seeds of the plant rather than either the whole plant or the fibrous stalks thereof. Further along in the opinion the court stated that it thought that the preponderant use of the word was clearly with reference to the product used for smoking. "Such use is so frequent and common that no one can misunderstand when the statute prohibits its unauthorized possession or sale as a drug. The information in this case charges the unlawful possession of mariguana in the language of the statute and that is sufficient."

Respecting the grammatical construction of the pertinent sentence, the defendant claimed that the words "flowering tops and leaves, extracts, tinctures, and preparations" were modified by the words "hemp, loco weed, (cannabis sativa, Indian hemp), mariguana, and chloral hydrate". But the court disagreed with this view, saying that, if this contention were correct, "the statute must be construed to prohibit possession of the flowering tops and leaves of chloral hydrate as well as of mariguana". This, however, was stated by the court to be an impossible construction because chloral hydrate was unquestionably not a plant but a drug.

In rejecting another contention of the defendant that it was incumbent on the State to produce evidence to prove the negative allegations of the information, the court quoted from 49 C.J. 1053 as follows:

Where the statute relating to poisons or narcotic drugs contains exceptions, a defendant desiring to avail himself of any of them by way of defense must show that he comes within its intent Thus the burden is upon one accused of illegal possession to show that his possession was lawful under a proviso or exception of the statute under which he is being prosecuted, or, where the animus possidendi is an element of the offense, to show honest ignorance of the fact of possession.

DEATHS DURING WEEK ENDED MAR. 3, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar 3, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	9,180	8,260
Deaths per 1,000 population, annual basis	12.8	11.5
Deaths under 1 year of age	657	617
Deaths under 1 year of age per 1,000 estimated live births	61	[1] 53
Deaths per 1,000 population, annual basis, first 9 weeks of year	12.7	12.5
Data from industrial insurance companies		
Policies in force	67,566,995	68,947,917
Number of death claims	15,836	15,423
Death claims per 1,000 policies in force, annual rate	12.2	11.7
Death claims per 1,000 policies, first 9 weeks of year, annual rate	10.9	11.4

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Mar. 10, 1934, and Mar. 11, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar 10, 1934, and Mar 11, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar 10, 1934	Week ended Mar 11, 1933	Week ended Mar 10, 1934	Week ended Mar 11, 1933	Week ended Mar 10, 1934	Week ended Mar 11, 1933	Week ended Mar 10, 1934	Week ended Mar 11, 1933
New England States								
Maine				1	1	2	0	0
New Hampshire			2	3	126		0	0
Vermont		1			54	21	0	0
Massachusetts	19	28		11	2, 356	355	2	0
Rhode Island	4	2		5	9		0	0
Connecticut	2	5	2	7	36	328	1	2
Middle Atlantic States								
New York	53	70	[1] 22	[1] 30	1, 330	3, 519	4	7
New Jersey	15	23	24	34	547	1, 594	0	2
Pennsylvania	54	78			3, 063	1, 242	7	7
East North Central States								
Ohio	17	43	21	215	888	529	0	0
Indiana	22	42	64	83	750	85	1	3
Illinois	23	31	39	68	1, 473	276	3	19
Michigan	18	19	3	9	95	1, 531	3	7
Wisconsin	5	5	66	137	1, 278	412	2	1
West North Central States								
Minnesota	4	5	2	2	315	1, 102	0	0
Iowa [3]	1	12	11		158	14	1	2
Missouri	35	27	188	17	1, 354	243	2	4
North Dakota	1	7	29	26	129	18	0	1
South Dakota	3	5			837	6	0	0
Nebraska	1	7		3	50	22	1	1
Kansas	11	4		6	256	237	0	4
South Atlantic States								
Delaware		1			269	2	0	0
Maryland [2]	7	8	21	70	670	6	0	0
District of Columbia	10	3	1	3	555	5	0	0
Virginia	26	18			1, 334	647	2	2
West Virginia	14	12	83	43	48	166	0	0
North Carolina	25	12	40	105	2, 822	371	1	2
South Carolina	7	5	871	918	654	204	0	0
Georgia [3]	16	8		445	1, 817	29	2	2
Florida	6	7	2	13	279	25	0	0
East South Central States								
Kentucky	27	13	113	77	635	67	0	2
Tennessee	8	9	132	85	1, 180	33	8	8
Alabama [3]	23	15	102	113	875	41	2	1
Mississippi [3]	3	7					0	1
West South Central States.								
Arkansas	7	4	105	49	492	119	0	2
Louisiana	35	23	16	56	185	40	0	1
Oklahoma [4]	15	21	124	141	490	71	0	0
Texas [3]	106	48	724	135	1, 131	710	3	1
Mountain States:								
Montana	8		26	15	57	94	1	0
Idaho	1	1		3	19	94	1	0
Wyoming				1	77	1	0	0
Colorado	6	2		47	235	3	0	7
New Mexico	9	11	2	2	58	12	0	1
Arizona	1	3	17		38	34	0	0
Utah [3]	1	1		5	624	4	0	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar 10, 1934, and Mar 11, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar 10, 1934	Week ended Mar 11, 1933	Week ended Mar 10, 1934	Week ended Mar 11, 1933	Week ended Mar 10, 1934	Week ended Mar 11, 1933	Week ended Mar 10, 1934	Week ended Mar 11, 1933
Pacific States								
Washington	2	4	2		173	3	0	0
Oregon	3	3	81	73	107	108	0	0
California	39	49	27	107	1,491	985	2	3
Total	693	702	2,971	3,163	31,420	15,410	49	95

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar 10, 1934	Week ended Mar 11, 1933	Week ended Mar 10, 1934	Week ended Mar 11, 1933	Week ended Mar 10, 1934	Week ended Mar 11, 1933	Week ended Mar 10, 1934	Week ended Mar 11, 1933
New England States								
Maine	0	0	10	14	0	0	1	2
New Hampshire	0	0	7	50	0	0	0	1
Vermont	0	0	6	15	0	0	0	0
Massachusetts	1	1	275	393	0	0	1	0
Rhode Island	0	0	23	25	0	0	0	0
Connecticut	0	0	71	115	0	0	1	1
Middle Atlantic States:								
New York	1	0	874	1,009	0	0	10	10
New Jersey	0	0	216	382	0	0	2	4
Pennsylvania	1	0	798	956	0	0	9	9
East North Central States								
Ohio	0	0	826	967	1	2	2	8
Indiana	0	0	261	197	1	1	2	1
Illinois	0	1	654	471	3	26	6	1
Michigan	0	1	801	558	6	2	3	4
Wisconsin	1	0	308	160	10	9	2	1
West North Central States								
Minnesota	0	0	66	88	5	0	0	0
Iowa [2]	0	0	85	53	18	49	1	1
Missouri	0	0	118	95	0	0	2	1
North Dakota	0	0	13	21	0	5	0	1
South Dakota	0	1	12	24	10	0	0	3
Nebraska	1	0	11	37	0	1	0	0
Kansas	0	0	97	58	1	0	1	2
South Atlantic States.								
Delaware	0	0	11	15	0	0	0	0
Maryland [2]	0	1	95	113	0	0	2	14
District of Columbia	0	0	17	21	0	0	0	0
Virginia	2	1	33	59	0	4	3	8
West Virginia	0	0	77	31	0	0	2	4
North Carolina	0	1	37	31	0	0	0	3
South Carolina	0	0	6	8	0	0	6	0
Georgia [3]	0	0	4	9	0	14	9	3
Florida	0	1	2	5	0	0	1	0
East South Central States								
Kentucky	0	0	60	50	0	0	6	9
Tennessee	0	1	26	49	9	0	3	5
Alabama [3]	0	0	10	14	0	1	0	1
Mississippi [2]	0	1	5	5	0	0	3	5
West South Central States								
Arkansas	0	0	5	19	2	22	4	1
Louisiana	0	0	22	18	1	0	17	5
Oklahoma [4]	0	1	17	31	0	9	7	0
Texas [3]	0	0	120	44	39	9	10	8
Mountain States								
Montana	0	0	17	16	0	1	0	7
Idaho	0	0	2	0	16	4	0	0
Wyoming	0	0	3	4	0	0	0	0
Colorado	0	0	24	43	2	1	0	1
New Mexico	1	0	24	8	1	0	0	0
Arizona	0	0	13	8	0	0	0	0
Utah [2]	0	0	7	19	4	0	0	1
Pacific States								
Washington	3	0	83	52	10	4	5	3
Oregon	0	0	38	10	0	2	2	2
California	2	2	247	217	4	39	11	9
Total	13	13	6,537	6,587	143	205	134	139

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Mar. 10, 1934, 15 cases, as follows: Georgia, 3, Alabama, 6, Texas, 6.
[4] Exclusive of Oklahoma City and Tulsa

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1934										
Kansas	4	46	24		192		1	588	12	8
Mississippi	1	65	5,092	1,674	2,493	196	2	86	7	15
Nevada		2	22		24		2	11	3	1
February 1934										
Arkansas	5	36	317	25	2,240	15	0	41	24	6
Connecticut		16	32		160		0	208	0	2
Delaware		10	3		782		0	65	0	0
District of Columbia	1	34	12		1,572	1	1	73	0	0
Maine	1	4	11		8		0	80	0	6
Massachusetts	6	27		1	8,637	1	0	972	0	9
Nebraska	1	29	95		305		0	93		2
Vermont		3			238		1	58	0	3
Wyoming	1	3		1	194		1	21	1	0

January 1934	Cases
Chicken pox:	
Kansas	940
Mississippi	730
Nevada	6
Dengue:	
Mississippi	3
Dysentery:	
Mississippi (amoebic)	26
German measles:	
Kansas	15
Hookworm disease:	
Mississippi	344
Impetigo contagiosa:	
Kansas	2
Lethargic encephalitis:	
Kansas	7
Mumps:	
Kansas	561
Mississippi	330
Ophthalmia neonatorum:	
Kansas	2
Puerperal septicemia:	
Mississippi	32
Rabies in animals:	
Mississippi	5
Scabies:	
Kansas	2
Tetanus:	
Kansas	1
Trachoma:	
Mississippi	4
Undulant fever:	
Kansas	6
Vincent's infection:	
Kansas	2
Whooping cough:	
Kansas	517
Mississippi	1,554
Nevada	4
February 1934	
Anthrax:	
Delaware	1
Massachusetts	2
Nebraska	1

February 1934—Contd	Cases
Chicken pox:	
Arkansas	76
Connecticut	415
Delaware	67
District of Columbia	94
Maine	291
Massachusetts	1,157
Nebraska	229
Vermont	228
Wyoming	74
Conjunctivitis:	
Connecticut	1
Wyoming	3
Dysentery:	
Connecticut (amoebic)	1
Delaware	1
Maine (amoebic)	1
Massachusetts (amoebic)	4
Massachusetts (bacillary)	2
Nebraska (amoebic)	1
German measles:	
Connecticut	9
Maine	65
Massachusetts	57
Wyoming	32
Lead poisoning:	
Connecticut	1
Massachusetts	1
Lethargic encephalitis:	
Massachusetts	3
Nebraska	1
Mumps:	
Arkansas	121
Connecticut	441
Delaware	18
Maine	13
Massachusetts	488
Nebraska	110
Vermont	32
Wyoming	27

February 1934—Contd.	Cases
Ophthalmia neonatorum:	
Arkansas	1
Massachusetts	46
Paratyphoid fever:	
Maine	1
Rabies in animals:	
Connecticut	2
Massachusetts	22
Rocky Mountain spotted fever:	
Wyoming	3
Septic sore throat:	
Connecticut	3
Maine	3
Massachusetts	21
Nebraska	4
Wyoming	4
Trachoma:	
Arkansas	5
Connecticut	1
Massachusetts	1
Trichinosis:	
Connecticut	2
Massachusetts	4
Undulant fever:	
Arkansas	1
Connecticut	2
Delaware	1
Maine	1
Vincent's infection:	
Maine	4
Whooping cough:	
Arkansas	94
Connecticut	154
Delaware	60
District of Columbia	102
Maine	326
Massachusetts	1,273
Nebraska	212
Vermont	58
Wyoming	17

CASES OF VENEREAL DISEASES REPORTED FOR JANUARY 1934

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases The figures are taken from reports received from State health officers They are preliminary and are, therefore, subject to correction It is hoped that the publication of these reports will stimulate more complete reporting of these diseases

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama [b]				
Arizona	21	0 48	40	0 92
Arkansas [c]	2		12	06
California	1,949	3 43	1,559	2 75
Colorado [a]				
Connecticut [b]				
Delaware	105	4.40	22	92
District of Columbia	139	2 85	98	2 01
Florida	567	3 86	72	49
Georgia	430	1 48	401	1 38
Idaho	0	0	0	0
Illinois	1,215	1 59	1,120	1 47
Indiana	133	41	122	38
Iowa [b]				
Kansas	73	39	53	28
Kentucky	238	91	357	1 37
Louisiana	170	81	114	54
Maine	57	71	49	61
Maryland	283	1 74	192	1 18
Massachusetts	372	88	516	1 21
Michigan [b]				
Minnesota	270	1 05	312	1 22
Mississippi	890	4 43	1,447	7 20
Missouri [b]				
Montana [c]	20	37	12	22
Nebraska	36	26	101	73
Nevada [a]				
New Hampshire	14	30	30	64
New Jersey	725	1 79	299	74
New Mexico [c]	44	1 04	44	1.04
New York	5,250	4.17	1,329	1 06
North Carolina	963	3 04	424	1 34
North Dakota	15	.22	39	57
Ohio [b]				
Oklahoma [c]	134	56	163	.68
Oregon [b]				
Pennsylvania	316	33	283	.29
Rhode Island	82	1 19	43	63
South Carolina [c]	401	2 31	599	3 44
South Dakota	11	16	33	48
Tennessee	1,024	3 91	553	2 12
Texas [b]				
Utah [a]				
Vermont	26	72	29	.81
Virginia [b]				
Washington	116	74	221	1.41
West Virginia [b]				
Wisconsin [d]	26	09	163	.55
Wyoming	4	18	4	.18
Total	16,121	1 83	10,855	1.23

[a] Not reporting
[b] Have been reporting regularly but no report received for current month
[c] Incomplete
[d] Only cases of syphilis in the infectious stage are reported

NOTE —Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6 6 for syphilis and 10 2 for gonorrhea.

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar 3, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	1	0	1	7	1	0	0	0	13	33
New Hampshire											
Concord	0	------	0	29	1	0	0	1	0	0	21
Nashua	0	------	0	1	0	2	0	0	0	2	------
Vermont											
Barre	0	------	0	0	0	0	0	1	0	0	1
Burlington	0	------	0	0	0	2	0	0	0	7	6
Massachusetts											
Boston	1	------	1	375	40	52	0	11	0	55	255
Fall River	0	------	0	0	2	1	0	2	2	2	28
Springfield	0	------	0	2	2	5	0	1	0	4	37
Worcester	2	------	0	35	5	8	0	0	0	5	49
Rhode Island											
Pawtucket	1	------	0	2	0	0	0	0	0	0	------
Providence	3	------	0	7	7	10	0	1	0	19	72
Connecticut											
Bridgeport	1	4	2	2	3	10	0	2	0	3	27
Hartford	1	------	0	0	6	10	0	1	0	1	44
New Haven	0	------	1	4	2	1	0	0	0	0	31
New York											
Buffalo	1	------	1	258	15	20	0	7	0	12	156
New York	40	32	17	62	213	206	0	106	6	113	1,737
Rochester	5	1	1	3	6	37	0	2	0	5	58
Syracuse	0	------	0	3	8	8	0	0	0	46	52
New Jersey											
Camden	0	2	0	148	4	4	0	0	0	1	43
Newark	0	4	0	6	12	27	0	9	0	23	119
Trenton	0	1	1	58	0	22	0	4	0	2	56
Pennsylvania											
Philadelphia	2	16	7	1,418	77	118	0	36	0	38	618
Pittsburgh	5	6	8	75	40	35	0	7	0	50	226
Reading	0	------	0	4	3	8	0	0	0	6	18
Scranton	0	------	0	0	0	6	0	0	0	10	------
Ohio											
Cincinnati	2	------	4	144	13	41	0	7	0	15	134
Cleveland	6	63	6	29	31	115	0	7	0	101	213
Columbus	4	1	1	6	6	38	0	4	0	16	86
Toledo	1	------	0	126	9	45	0	3	0	66	74
Indiana											
Fort Wayne	2	------	1	6	1	10	0	0	0	1	21
Indianapolis	1	------	2	230	17	29	0	6	0	35	------
South Bend	0	------	0	0	3	10	0	0	0	0	22
Terre Haute	0	------	1	3	1	0	0	0	0	5	22
Illinois											
Chicago	0	14	3	64	66	302	0	31	0	195	717
Cicero	0	------	0	0	0	0	0	0	0	0	3
Springfield	0	2	0	78	6	0	0	0	0	13	31
Michigan											
Detroit	8	2	8	17	40	181	0	16	0	113	261
Flint	0	------	1	3	6	99	0	1	1	0	29
Grand Rapids	0	------	0	1	3	25	0	0	0	5	36
Wisconsin											
Kenosha	0	------	0	0	0	27	0	1	0	0	7
Milwaukee	1	1	1	9	0	103	0	4	0	109	100
Racine	1	------	0	0	2	10	1	0	0	11	13
Superior	0	------	0	0	0	0	0	0	0	2	6
Minnesota:											
Duluth	0	------	2	0	1	2	0	1	0	3	28
Minneapolis	8	------	1	4	5	12	0	2	0	18	115
St. Paul	0	------	0	1	10	9	2	5	0	5	70
Iowa:											
Des Moines	0	------	------	0	------	17	0	------	0	0	34
Sioux City	1	------	------	12	------	2	0	0	0	0	------
Waterloo	0	------	------	0	------	0	0	------	0	9	------
Missouri:											
Kansas City	2	------	1	10	11	33	0	6	0	62	85
St. Joseph	4	------	0	9	9	4	0	0	0	0	31
St. Louis	25	3	1	468	18	16	0	7	1	63	243

City reports for week ended Mar 3, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Dakota											
Fargo	0	------	0	124	0	0	0	1	0	2	8
South Dakota											
Aberdeen	0	------	0	3	0	0	0	0	0	2	------
Sioux Falls	0	------	0	19	0	0	0	0	0	0	8
Nebraska											
Omaha	2	------	1	184	6	6	1	3	0	18	64
Kansas											
Topeka	0	------	0	1	3	5	0	1	0	5	19
Wichita	1	------	0	11	6	3	0	2	1	5	32
Delaware											
Wilmington	1	------	0	53	1	3	0	0	0	3	30
Maryland											
Baltimore	8	3	1	411	47	34	0	7	0	136	235
Cumberland	0	2	0	0	2	6	0	0	0	2	14
Frederick	------	------	------	------	------	------	------	------	------	------	------
District of Columbia											
Washington	7	1	1	514	18	16	0	13	1	22	178
Virginia											
Lynchburg	1	------	1	0	2	1	0	4	0	0	16
Richmond	2	2	1	47	7	3	0	0	1	6	70
Roanoke	2	------	1	0	1	1	0	1	0	0	23
West Virginia											
Charleston	0	------	0	0	4	0	0	1	0	0	14
Huntington	2	------	0	0	0	5	0	0	0	0	------
Wheeling	0	------	0	0	8	6	0	0	0	4	21
North Carolina											
Raleigh	0	------	0	26	4	0	0	0	0	6	16
Wilmington	0	------	0	0	1	0	0	0	0	0	10
Winston-Salem	2	2	1	81	5	1	0	1	0	3	17
South Carolina											
Charleston	0	59	1	27	4	0	0	0	0	1	29
Columbia	------	------	------	------	------	------	------	------	------	------	------
Greenville	0	------	0	3	3	1	0	0	0	8	12
Georgia											
Atlanta	5	27	3	296	12	4	0	4	0	2	93
Brunswick	0	------	0	177	1	0	0	0	0	0	3
Savannah	1	46	3	74	6	2	0	2	1	0	44
Florida											
Miami	0	------	0	4	3	0	0	1	0	4	38
Tampa	2	------	0	19	0	0	0	0	0	0	18
Kentucky											
Ashland	------	------	------	------	------	------	------	------	------	------	------
Lexington	1	------	0	1	3	0	0	0	0	5	19
Tennessee											
Memphis	0	------	2	386	12	0	0	3	0	8	93
Nashville	0	------	1	108	11	2	0	0	0	13	51
Alabama											
Birmingham	0	10	3	70	8	2	0	5	0	1	69
Mobile	1	1	1	11	1	0	0	0	0	0	16
Montgomery	1	1	------	16	------	1	0	------	0	3	------
Arkansas											
Fort Smith	0	------	------	36	------	0	0	------	0	0	------
Little Rock	0	------	0	115	4	0	0	2	0	1	9
Louisiana											
New Orleans	21	5	5	17	19	8	0	13	1	0	154
Shreveport	1	------	1	5	7	3	0	1	1	4	31
Texas											
Dallas	9	4	4	0	11	16	1	1	0	0	67
Fort Worth	1	------	0	0	12	7	0	0	0	8	50
Galveston	0	------	0	0	3	2	0	0	0	0	12
Houston	12	------	0	11	11	12	3	2	0	0	70
San Antonio	0	------	1	7	10	2	0	9	0	6	52
Montana											
Billings	0	------	0	0	0	1	0	0	0	0	4
Great Falls	0	------	0	2	3	0	0	0	0	0	11
Helena	0	------	0	0	0	0	0	0	0	0	1
Missoula	0	------	0	0	0	1	0	0	0	0	5
Idaho											
Boise	0	------	0	5	2	0	2	0	0	3	10
Colorado											
Denver	0	43	0	79	8	20	0	6	0	88	97
Pueblo	0	------	0	0	0	2	0	2	0	13	14
New Mexico											
Albuquerque	0	------	0	2	2	2	0	2	0	7	9
Utah											
Salt Lake City	0	------	0	306	5	4	0	1	0	18	38

City reports for week ended Mar 3, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Nevada											
Reno	0	------	0	2	1	1	0	0	0	0	6
Washington											
Seattle	0	------	2	1	6	26	4	4	1	73	75
Spokane	0	------	--------	85	2	3	0	1	0	9	29
Tacoma	0	------	0	16	4	3	0	0	0	16	33
Oregon											
Portland	0	------	1	2	11	11	0	3	0	7	82
Salem	0	3	0	0	0	0	0	0	0	2	--------
California											
Los Angeles	20	39	0	48	17	46	0	22	0	52	296
Sacramento	1	4	1	4	5	1	0	4	0	1	38
San Francisco	0	3	1	105	15	17	0	8	1	26	160

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts				Missouri			
Boston	2	0	0	Kansas City	1	0	0
New York				Tennessee			
New York	2	4	1	Memphis	0	1	0
Pennsylvania				Alabama			
Philadelphia	1	0	0	Birmingham	0	1	0
Ohio				Texas			
Cleveland	1	0	0	Fort Worth	0	1	0
Illinois				Colorado			
Chicago	4	2	0	Denver	0	1	0
Michigan				Utah			
Grand Rapids	0	0	1	Salt Lake City	1	0	0
Minnesota							
Duluth	1	0	0				

Lethargic encephalitis —Cases· Springfield, Mass , 1, Grand Rapids, 1; San Francisco, 1

Pellagra—Cases Miami, 1, Tampa, 1, Memphis, 2, Montgomery, 1, New Orleans, 1; San Francisco, 1

Typhus fever.—Cases New York, 1, Galveston, 1.

FOREIGN AND INSULAR

BELGIUM

Deaths during 1932.—During the year 1932, 108,226 deaths occurred in Belgium, giving a rate of 13.18 per 1,000 population. Deaths from certain causes were reported as follows.

Disease	Number of deaths	Deaths per 100,000 population	Disease	Number of deaths	Deaths per 100,000 population
Bronchitis	3,132	38.1	Nephritis	2,456	29.9
Cancer and other malignant tumors	8,267	100.7	Pneumonia	7,910	96.3
Cerebral hemorrhage	7,618	92.8	Puerperal septicemia and puerperal infections	250	3.0
Diarrhea and enteritis (under 2 years)	1,679	20.4	Scarlet fever	150	1.8
Diphtheria	464	5.6	Syphilis	83	1.0
Heart disease	16,438	200.2	Tuberculosis, pulmonary	5,247	63.9
Influenza	3,110	37.9	Tuberculosis, other forms	1,527	18.6
Malaria	10		Typhoid and paratyphoid fever	178	2.2
Measles	477	5.8	Whooping cough	647	7.9

CANADA

Provinces—Communicable diseases—2 weeks ended February 24, 1934.—During the 2 weeks ended February 24, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, for 8 provinces, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	British Columbia	Total
Cerebrospinal meningitis				1	1				2
Chicken pox		26	8	223	444	75	82	76	934
Diphtheria		14		32	16	15	13	2	92
Dysentery							3		3
Erysipelas		1		26	6	1	2		36
Influenza	92	20		15	32	55		32	246
Lethargic encephalitis							1		1
Measles		7	2	172	60	273	322	8	844
Mumps					281	10	9	136	436
Pneumonia		5			28		4	12	49
Poliomyelitis		1		3					4
Scarlet fever	1	18	2	164	281	38	9	196	709
Smallpox							1	4	5
Trachoma							1	2	3
Tuberculosis	2	6	1	100	54	7	5	54	229
Typhoid fever			3	69	3		2		77
Undulant fever				1	3		1		5
Whooping cough		7		509	241	74	72	27	930

NOTE.—No report was received from Alberta for the above period

GREAT BRITAIN

Scotland—Vital statistics—Quarter ended December 31, 1933.—The Registrar General of Scotland has published the following vital statistics for Scotland for the fourth quarter, ended December 31, 1933.

Population, estimated	4,916,000
Births	20,415
Birth rate per 1,000 population	16 5
Deaths	15,883
Death rate per 1,000 population	12 8
Deaths under 1 year	1,612
Deaths under 1 year per 1,000 births	79
Marriages	8,723
Deaths from	
Bronchitis	785
Broncho-pneumonia	515
Cancer	1,982
Cerebrospinal fever	33
Diabetes	200
Diphtheria	117
Dysentery	3
Erysipelas	68
Heart disease	2,726
Deaths from—Continued	
Influenza	164
Lethargic encephalitis	20
Measles	2
Nephritis, acute	56
Nephritis, chronic	301
Nephritis, unspecified	111
Paratyphoid fever	4
Pneumonia (lobar)	351
Pneumonia, unspecified	230
Poliomyelitis	5
Puerperal sepsis	62
Scarlet fever	122
Syphilis	16
Tetanus	4
Tuberculosis	870
Typhoid fever	4
Whooping cough	56

Vital statistics—Year 1933.—The following table shows the provisional figures for Scotland for the year 1933.

Births	86,546
Birth rate per 1,000 population	17 6
Deaths	64,848
Death rate per 1,000 population	13 2
Deaths under 1 year	7,019
Deaths under 1 year per 1,000 births	81
Marriages	34,215
Deaths from	
Bronchitis	3,289
Cancer	7,518
Cerebrospinal fever	220
Cirrhosis of liver	131
Diabetes	711
Deaths from—Continued	
Diphtheria	356
Heart disease	10,488
Influenza	2,027
Measles	36
Nephritis, acute and chronic	1,749
Pneumonia (all forms)	4,599
Puerperal sepsis	213
Scarlet fever	310
Suicide	523
Tuberculosis	3,910
Typhoid fever	30
Whooping cough	762

INDIA

Vital statistics.—According to the 1931 census of India, the population of that country was 353,837,778, representing an increase of 10.6 percent since the census of 1921. The density of population ranged from 6 5 persons per square mile in the arid regions of Sind and Baluchistan to 814 2 in Cochin State and 935 in Bengal. The average density for the entire country was 195 persons per square mile. The population of British India was 256,859,787 as compared with 81,310,845 for the native States.

The birth rate for 1930 was 33.2 per 1,000 population, and the death rate was 26.1 per 1,000. The infant mortality rate was 180 8 in 1930, as compared with 194.9 in 1920. By far the greater number of deaths among infants under 1 year were said to be due to infantile debility, malformation, and respiratory diseases. Despite the high death rates the excess of births over deaths during the period 1921–31 was 20,000,000.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Feb 23, 1934, pp 276-288 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Mar 30, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

CHOLERA

Philippine Islands —During the week ended March 10, 1934, cholera was reported in the Philippine Islands as follows: Bohol Province—Calape, 3 cases, 1 death, Clarin, 4 cases, 2 deaths; Inabanga 17 cases, 5 deaths; Loon, 3 deaths; Tagbilaran, 1 case, 1 death; Talibon, 13 cases, 7 deaths, Tubigon, 11 cases, 7 deaths. Oriental Negros Province—Tanjay, 13 cases, 6 deaths.

SMALLPOX

Mexico—Coahuila—Monclova —A report dated March 3, 1934, states that 8 cases of smallpox have appeared in Monclova, Coahuila, Mexico. One death has been reported.

Palestine —During the week ended March 3, 1934, 10 cases of smallpox were reported in Palestine.

x

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 13

MARCH 30 - - - - - 1934

IN THIS ISSUE

Sickness Among Industrial Employees, Final Quarter, 1933
Epidemic of Malaria Among Drug Addicts in New York City
Experiments on Spotted Fever and Boutonneuse Fever
Deaths in Large Cities During the Week Ended March 10
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93; title 44, section 220

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease, (3) other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

	Page
Sickness among male industrial employees during the final quarter of 1933	419
Malaria among drug addicts in New York City—An epidemic of aestivo-autumnal and quartan malaria among drug addicts in New York City transmitted by the use of contaminated hypodermic syringes	421
Comparative experiments on spotted fever and boutonneuse fever (I)	423
Court decision on public health	428
Deaths during week ended March 10, 1934	
Deaths and death rates for a group of large cities in the United States	429
Death claims reported by insurance companies	429
PREVALENCE OF DISEASE	
United States	
Current weekly State reports	
Reports for weeks ended March 17, 1934, and March 18, 1933	430
Summary of monthly reports from States	432
Outbreak of psittacosis in Pittsburgh, Pa	433
Weekly reports from cities.	
City reports for week ended March 10, 1934	433
Foreign and insular	
Canada—Ontario Province—Communicable diseases—4 weeks ended Feb. 24, 1934	437
Cuba—Provinces—Notifiable diseases—4 weeks ended Oct. 28, 1933	437
Yugoslavia—Communicable diseases—January 1934	437
Cholera, plague, smallpox, typhus fever, and yellow fever	
Cholera	438
Plague	440
Smallpox	442
Typhus fever	447
Yellow fever	449

PUBLIC HEALTH REPORTS

VOL. 49 MARCH 30, 1934 NO. 13

SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE FINAL QUARTER OF 1933 [1]

By DEAN K BRUNDAGE, *Statistician, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

During the fourth quarter of 1933 the incidence rate of cases of illness causing disability for 8 consecutive days or longer among 154,000 male industrial employees was lower than in the corresponding period of any one of the 4 preceding years It is considerably below that for the fourth quarter of 1932, in which period an outbreak of influenza began in November. The influenza rate during the recent quarter-year was less than half that recorded for the last quarter of 1932. As might have been expected, the pneumonia rate was also lower than in the same period of the preceding year; but it was higher than in the fourth quarter of 1931. A favorable rate is indicated for new cases of tuberculosis of the respiratory system during the closing months of 1933 Diseases of the upper respiratory tract caused fewer 8-day or longer absences from work than in the corresponding period of 1929, 1930, and 1931.

For nonindustrial injuries the rates remain remarkably constant—13 5 cases per year per 1,000 men for the quarter under report

The relatively low sickness rate for the recent quarter was due principally to a decrease in the nonrespiratory diseases. This is the first time that nonrespiratory cases have decreased in frequency enough to lower appreciably the total rate for sickness The fourth-quarter rate for nonrespiratory diseases was 37.5 cases per 1,000 men per year, as compared with an average or expected rate of about 46.0 for the period Within this very broad disease group no single disease or group of related diseases accounted for the lower incidence rate for the group as a whole; the favorable showing resulted from somewhat lower rates for a number of different pathological conditions, among which may be mentioned diseases of the stomach, hernia, the rheumatic group, neurasthenia, and even the circulatory-genito-urinary diseases. Little change, however, took place in the

[1] The report for the third quarter of 1933 was published in the Public Health Reports of Jan. 12, 1934

occurrence of appendicitis, "other" digestive diseases, the more serious diseases of the nervous system embraced in the category "other diseases of the nervous system", and the epidemic and endemic disease groups. On the whole, however, morbidity as gaged by the frequency of claims for sickness benefits in a sample of the industrial population of the country presents a favorable picture in comparison with the fourth-quarter results for each of the 4 preceding years.

As explained in earlier communications, these sickness data apply in the main to employed men, although many may work only on a part-time basis. The reporting companies or sick-benefit associations cover all parts of the country, but most of them are located in the North Central and North Atlantic States.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the fourth quarter of 1933 compared with the same quarter of each of the four preceding years (male morbidity experience of 35 industrial companies which reported their cases to the United States Public Health Service)* [1]

Diseases and disease groups which caused disability (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929)	Annual number of disabilities per 1,000 men in the fourth quarter of—				
	1933	1932	1931	1930	1929
Sickness and nonindustrial injuries [2]	78.0	104.3	84.3	87.2	96.6
Nonindustrial injuries	13.5	13.9	13.5	13.0	13.1
Sickness [2]	64.5	90.4	70.8	74.2	83.5
Respiratory diseases	27.0	44.9	25.2	27.6	37.1
Influenza and grippe (11)	12.3	29.8	10.7	11.6	15.1
Bronchitis, acute and chronic (106)	3.4	3.1	3.5	4.2	6.2
Pneumonia, all forms (107–109)	2.2	2.6	1.7	2.5	3.1
Diseases of the pharynx and tonsils (115a)	3.6	4.0	4.5	4.3	6.8
Tuberculosis of the respiratory system (23)	.6	.8	.8	.8	1.1
Other respiratory diseases (104, 105, 110–114)	4.9	4.6	4.0	4.2	4.8
Nonrespiratory diseases	37.5	45.5	45.6	46.6	46.4
Diseases of the stomach, cancer excepted (117, 118)	2.9	3.5	3.8	3.9	3.7
Diarrhea and enteritis (120)	1.0	1.1	1.2	1.5	1.4
Appendicitis (121)	3.4	3.6	3.6	3.4	3.8
Hernia (122a)	1.0	1.7	1.5	2.1	1.3
Other digestive diseases (115b, 116, 122b–129)	2.9	3.1	2.9	2.9	2.5
Rheumatic group, total	8.3	10.6	9.9	10.4	12.1
Rheumatism, acute and chronic (56, 57)	3.5	4.8	4.4	4.9	5.0
Diseases of the organs of locomotion (156b)	2.8	3.3	3.4	3.3	4.0
Neuralgia, neuritis, sciatica (87a)	2.0	2.5	2.1	2.2	3.1
Neurasthenia and the like (part of 87b)	.8	1.0	1.4	1.2	1.1
Other diseases of the nervous system (78–85, part of 87b)	1.3	.9	1.2	1.0	1.1
Diseases of the heart and arteries and nephritis (90–99, 102, 130–132)	2.9	3.9	3.5	3.5	3.7
Other genito-urinary diseases (133–138)	2.1	2.5	2.4	2.3	2.1
Diseases of the skin (151–153)	2.6	2.6	3.1	3.7	3.5
Epidemic and endemic diseases except influenza (1–10, 12–18, 33, 37, 38, part of 39 and 44)	1.7	1.8	1.7	1.6	1.8
Ill-defined and unknown causes (200)	1.5	2.2	2.0	1.6	1.7
All other diseases (19–22, 24–32, 36, part of 39 and 44, 40–43, 45–55, 58–77, 88, 89, 100, 101, 103, 154–156a, 157, 162)	5.1	7.0	7.4	7.5	6.6
Average number of males covered in the record	154,385	135,470	158,090	154,165	160,023
Number of companies included	35	35	32	27	23

[1] In 1932 and 1933 the same companies are included. The rates for 1931, 1930, and 1929 cover 32, 27, and 23 companies, respectively, instead of 35 in 1932 and 1933.
[2] Exclusive of disability from venereal diseases.

MALARIA AMONG DRUG ADDICTS IN NEW YORK CITY

An Epidemic of Aestivo-Autumnal and Quartan Malaria Among Drug Addicts in New York City Transmitted by the Use of Contaminated Hypodermic Syringes

By MILTON HELPERN, M D, *Assistant Medical Examiner, Office of the Chief Medical Examiner, City of New York*

Sixteen fatal cases of aestivo-autumnal malaria of the cerebral type and one fatal case of quartan malaria complicated by broncho-pneumonia were autopsied by the office of the chief medical examiner during a recent 4-month period. The first case was autopsied September 29, 1933, and the most recent case was autopsied January 30, 1934 An additional fatal case of aestivo-autumnal malaria occurred and was autopsied at the United States Marine Hospital at Ellis Island and was called to our attention by Dr. E A. Sweet, medical director, United States Public Health Service, thus bringing the total fatalities to 18. In every instance the deceased was a drug addict who injected heroin intravenously—the so-called "main-line shooter."

Cases of malaria in drug addicts in New York City, Sept 25, 1933, to Feb 8, 1934

Type and locality	Fatal cases	Cases in living patients	Total
Aestivo-autumnal			
Bellevue Hospital	12	7	19
U S Marine Hospital, Ellis Island	1	1	2
Correction Hospital, Welfare Island	2	6	8
Gouverneur Hospital	1	1	2
Lodging house	1		1
Private physician		2	2
Total	17	17	34
Tertian Correction Hospital, Welfare Island		1	1
Quartan			
Bellevue Hospital	1	3	4
Correction Hospital, Welfare Island		2	2
Total	1	5	6
Total number	18	23	41

An investigation carried on with the assistance of Detective Jocker of the narcotic squad and Detective Oswald of the homicide squad of the police department revealed that almost all of the deceased addicts had frequented the same lodging houses, that many had never been out of New York City, and that a few had been to the Tropics. These findings indicated a direct transmission of the disease from individual to individual, and a knowledge of the technique of intravenous drug injection employed by the addicts readily explained how it occurred. The syringe, which is usually improvised from a medicine or "eye" dropper inserted into a hypodermic needle, designated

as a "spike", is frequently used in rapid succession, without preliminary washing or sterilization, by two or more addicts for intravenous injection of heroin This method of taking the drug is comparatively new in New York, but has been practiced for many years in other localities Since a quantity of blood always flows back into the syringe when the needle enters the vein, a malarious addict will in this way introduce malarial parasites into the syringe The addict who next uses the apparatus cannot help but inject some of this blood into his vein, and in this very simple manner inoculates himself with whatever type of malaria his associates may have. He, in turn, after a period of incubation, becomes a carrier capable of transmitting the disease in the same manner in which he acquired it. This method of malarial transmission among intravenous drug addicts was first described in 1929 by Biggam (1) in Egypt, and more recently in 1933 by Nickum (2) in Omaha, by Faget (3) in New Orleans, by Eaton and Feinberg (4) in Chicago, by Himmelsbach (5) at Fort Leavenworth Penitentiary, Kans., and by others.

With the permission of former Deputy Commissioner of Correction Tudor, and with the assistance of Dr. Barland of Correction Hospital, a malarial survey of a group of addicts at the Tombs Prison and at Correction Hospital was carried out on November 28, 1933. Out of a routine examination of the blood smears from 150 addicts not suspected of having malaria, 9 individuals were found who harbored malarial parasites in their blood; 8 of these 9 were aestivo-autumnal, 1 was a tertian. On being questioned, these carriers readily admitted sharing their syringes with each other and also with many of the addicts who had died of malaria. Many of these individuals stated that they had never been out of New York City. One admitted recent malarial infection in the Tropics. In addition to the cases revealed by survey, 9 other nonfatal cases of aestivo-autumnal malaria have been discovered and also 5 additional cases of quartan malaria, a type very unusual in this part of the world. The quartan cases are the most recent All the cases were in drug addicts.

In spite of a warning which has been issued to addicts concerning the danger of malarial transmission by the common use of an unsterilized syringe, new cases continue to occur. Our survey was only complete enough to establish definitely the mode of direct transmission of the disease in intravenous drug addicts. A general and complete malarial survey of all the prisons and lodging houses in various parts of the city where drug addicts congregate is indicated as a public-health measure. Carriers should be effectively isola and treated in order to prevent further direct transmission and also to prevent possible indirect transmission to the general population by *Anopheles* mosquitoes when warm weather arrives. There is also the obvious danger of malarial carriers acting as donors for blood

transfusions. Additional considerations are the possible spreading of other parasitic blood diseases such as trypanosomiasis and syphilis.

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COMPARATIVE EXPERIMENTS ON SPOTTED FEVER AND BOUTONNEUSE FEVER (I) [1]

By GORDON E. DAVIS, *Bacteriologist*, and R R PARKER, *Special Expert, United States Public Health Service*

Recent tests have been made to determine the protective value of Rocky Mountain spotted fever vaccine against the virus of boutonneuse fever. These experiments were suggested by the observations of Badger (1933), who found reciprocal cross-immunity between these two typhus-like diseases, and our own subsequent experience which has confirmed and extended these findings.

Ticks (*Rhipicephalus sanguineus*) infected with boutonneuse fever virus were received, through the courtesy of Dr. Jean Caminopetros, of the Pasteur Institute of Greece, to whom our request for virus had been referred by the kindness of Dr. E Brumpt, of the Faculty of Medicine of Paris. Guinea pigs injected with saline emulsions of these ticks showed typical febrile and scrotal reactions The latter consist of reddening and swelling similar to the scrotal reaction in spotted fever, but less marked. Transfers by heart blood taken at the height of fever failed to continue the strain. Consequently, passage by testicular washings was attempted in a manner similar to that sometimes used in the transfer of the virus of endemic typhus. The testes and adnexa were removed aseptically, placed in about 12 cc of physiologic saline, and thoroughly shaken. The resultant washings constitute the virus. From 1 to 3 cc were injected intraperitoneally Nutrient broth inoculated with this material has

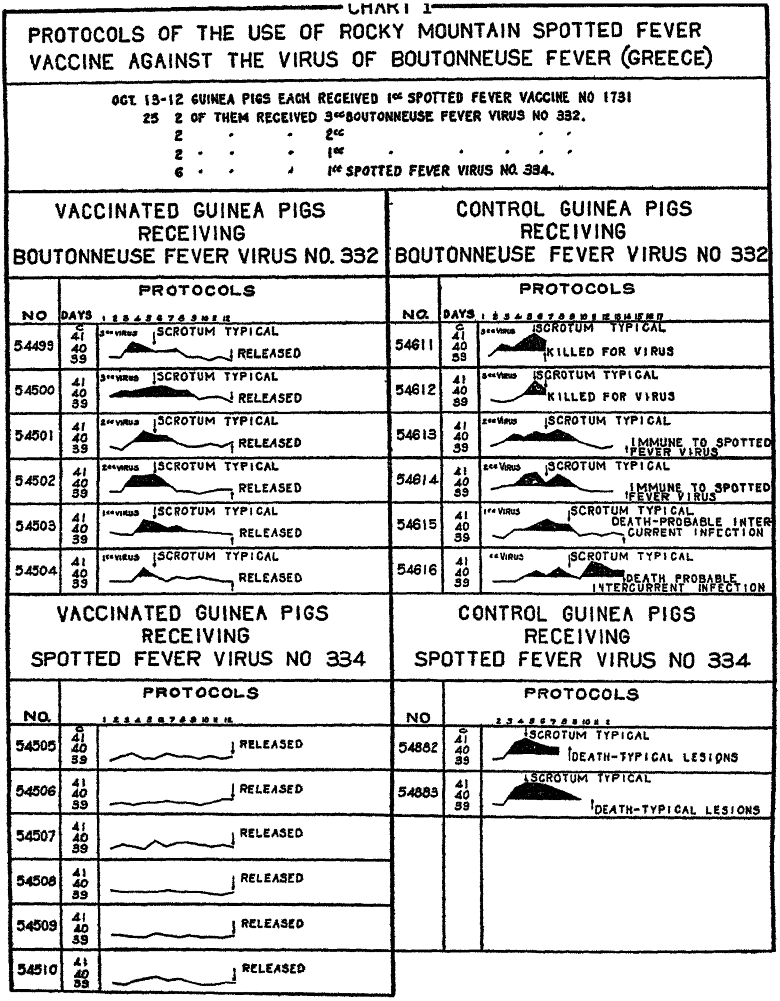
[1] Contribution from Rocky Mountain Spotted Fever Laboratory of the United States Public Health Service at Hamilton, Mont

remained uniformly without visible growth. By this method we have been able to continue this strain without difficulty over a period of 3 months.

TEST 1

On October 13, 1933, 12 guinea pigs received 1 cc each of spotted fever vaccine no 1731. Twelve days later, 2 of the vaccinated pigs

CHART 1



received 3 cc each; 2, 2 cc; and 2, 1 cc of the testicular washings from a guinea pig showing a characteristic boutonneuse fever reaction. Six control animals were injected in the same manner. As controls on the protective value of the vaccine against spotted fever, the remaining 6 guinea pigs received 1 cc each of spotted fever (blood) virus no 334. Two normal animals also received 1 cc each of the virus.

Results.—As seen in chart 1, all experimental and control guinea pigs receiving the virus of boutonneuse fever developed typical febrile and scrotal reactions.

All the vaccinated animals survived and were released on the twenty-first day The two control guinea pigs which received 3 cc each of virus were sacrificed at the height of fever for continuation of the strain, the two controls which received 2 cc of the virus survived and were later completely immune to a dose of spottted fever virus which produced typical spotted fever in control guinea pigs; the two controls which received 1 cc of the virus died 13 and 14 days, respectively, following injection of the virus. Although the spleens and the testes and adnexa were typical of boutonneuse fever, it is possible that the deaths of the last two controls were due to a secondary infection, especially that of guinea pig no 54616, as suggested by a terminal rise in temperature. In our limited experience, guinea pigs seldom die from uncomplicated boutonneuse fever

None of the vaccinated guinea pigs receiving spotted fever virus showed any evidence of infection while the two controls died typically.

It was thought that the difference in the protective value of the spotted fever vaccine against the two viruses might depend upon the material containing the virus, inasmuch as it has been shown that testicular extracts markedly influence the action of certain viruses. Consequently, a second test was made as follows:

TEST 2

Six vaccinated and six unvaccinated control guinea pigs each received the pooled testicular washings from two spotted fever guinea pigs in exactly the same manner as in the test with boutonneuse fever virus. Five additional vaccinated guinea pigs (one had died of intercurrent infection) each received 1 cc of blood virus from the guinea pigs which supplied the testicular washings

Results (chart 2) —None of the vaccinated guinea pigs which received the testicular washings or blood virus showed any evidence of illness. Five of the control guinea pigs which received only testicular washings died of typical spotted fever; one survived Of the two control guinea pigs which received only blood virus, one died of typical spotted fever, while the other recovered following a frank clinical course.

DISCUSSION

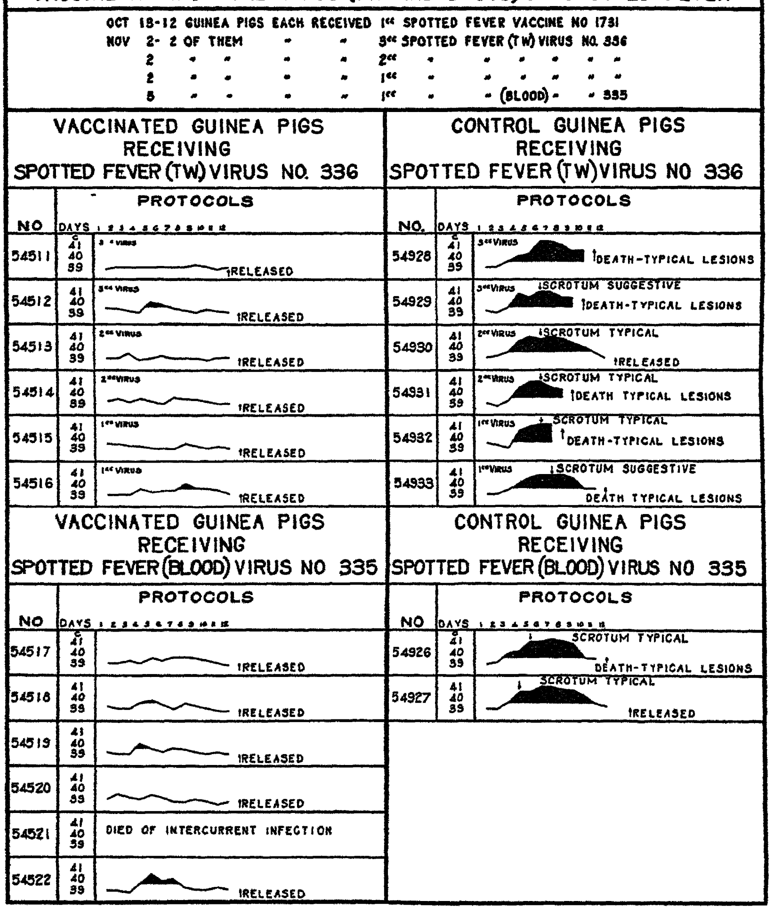
The thermic and scrotal reactions to boutonneuse fever virus in the guinea pigs that had been injected with spotted fever vaccine were similar, in all respects, to these reactions as observed in several hundred nonvaccinated guinea pigs injected with this virus. In

view of the reciprocal cross immunity which exists between the two diseases, this failure to afford protection is somewhat surprising, inasmuch as the virus of boutonneuse fever produces much less severe reactions in guinea pigs than does the virus of spotted fever.

Cross-immunity tests between these two diseases have also been made by Brumpt (1932). The interpretation of his results would be

CHART 2

PROTOCOLS OF THE USE OF ROCKY MOUNTAIN SPOTTED FEVER VACCINE AGAINST THE VIRUS (TW AND BLOOD) OF SPOTTED FEVER



TW TESTICULAR WASHINGS

the same as that for the tests of Badger and of ourselves if only temperatures above 39.6° C. were considered as fever. Felix (1933), apparently unaware of the experimental results herein referred to, has already suggested the probability of cross immunity between these two diseases, his opinion being based on the similarity of the results of agglutination tests with the several strains of *proteus* X.

It is of interest to compare the above results with those of studies which have had to do with the relationship between Rocky Mountain spotted fever and Sao Paulo "typhus" The latter have shown a reciprocal cross immunity; and vaccine prepared against spotted fever from spotted fever infected *D andersoni* protects against both diseases, as does also vaccine prepared against Sao Paulo "typhus" from "typhus"-infected *Amblyomma cajennense* On the other hand, though there is a reciprocal cross immunity between spotted fever and boutonneuse fever, spotted fever vaccine has no protective value against boutonneuse fever This leads to the point that though we have found no difference in the gross lesions of Sao Paulo "typhus" and spotted fever in guinea pigs, there are two marked differences in the case of boutonneuse fever. In the two former the spleen is smooth and the tunica is not adherent to the testis, which frequently snaps off when withdrawn from the scrotal sac. In boutonneuse fever, on the other hand, the spleen surface is rough, owing to the prominence of the malpighian corpuscles, and the tunica is, as a rule, adherent to the entire surface of the testis, the adhesion extending nearly or quite to the polar fat. These lesions in boutonneuse fever closely resemble those of endemic typhus

SUMMARY AND CONCLUSIONS

With the methods employed, spotted fever vaccine which afforded complete protection against the virus of spotted fever in guinea pigs showed no protection against the virus of boutonneuse fever

From the above observations it seems probable that boutonneuse fever is less closely related to spotted fever than is Sao Paulo "typhus."

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COURT DECISION ON PUBLIC HEALTH

Requirement of city ordinance that pasteurized milk sold in city be pasteurized in city held invalid—(Minnesota Supreme Court; *State ex rel. Larson* v *City of Minneapolis et al*, 251 N W. 121; decided Nov. 17, 1933) An ordinance of the city of Minneapolis, among other things, made it unlawful to sell within the city any pasteurized milk or its products unless the same had been pasteurized in a pasteurization plant located within the city and by the process described in the ordinance A license, known as a pasteurized milk license, was also required. The owner of a pasteurization plant, located about 30 miles from Minneapolis, brought a mandamus proceeding to compel the issuance of a license to sell pasteurized milk and its products within the city The lower court upheld the ordinance and denied the relief prayed for, and the relator appealed to the supreme court.

In speaking of the need for milk inspection, the trial court had stated, in part, as follows:

> * * * It is obvious that adequate inspection is a reasonable precaution. It is obvious that consideration of convenience, efficiency and cost of inspection are proper to be taken into account in determining the question of reasonableness It is also obvious that there is somewhere a limit of distance beyond which inspection by the city's agents would be too inconvenient, too costly, and too likely to be ineffective to be practicable. It seems to me there can be no doubt of the right of the city council to fix a reasonable limit beyond which it will not provide for inspection, and beyond which, for that reason, pasteurization plants will not be licensed In this ordinance the limit is the boundary line of the municipality

The supreme court said that the issue, then, was limited to the question of whether or not provision by the city for adequate inspection of relator's pasteurization plant, transportation facilities, etc., was so expensive and inconvenient to the city as to justify prohibition by it of relator's established business unless he moved his pasteurization plant into the city. The court then reviewed the inspection work done by the city and reached the conclusion that the provision of the ordinance attacked was invalid, concluding its opinion as follows:

> If the inspection fee is deemed insufficient, there appears to be no good reason why such insufficiency cannot be remedied in a manner that would impose no unjust hardship on anyone concerned. There is nothing in the record to show what, if any, inconvenience the city may be put to that would justify such a harsh requirement as provided by the ordinance. We are obliged to hold that

the ordinance, insofar as it prohibits the sale of pasteurized milk or its products in the city of Minneapolis, unless the same shall have been pasteurized in a pasteurization plant located within the city limits, violated relator's constitutional rights of property and contract The restriction contained therein goes "beyond the reasonable demands of the occasion" and is not adaptable to the end sought.

DEATHS DURING WEEK ENDED MAR. 10, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar 10, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	9,454	8,547
Deaths per 1,000 population, annual basis	13 2	11 9
Deaths under 1 year of age	683	602
Deaths under 1 year of age per 1,000 estimated live births	64	[1] 51
Deaths per 1,000 population, annual basis, first 10 weeks of year	12 7	12 4
Data from industrial insurance companies		
Policies in force	67,571,251	68,890,681
Number of death claims	15,707	14,326
Death claims per 1,000 policies in force, annual rate	12.1	10 8
Death claims per 1,000 policies, first 10 weeks of year, annual rate	11 0	11.3

[1] Data for 81 cities

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Mar. 17, 1934, and Mar. 18, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 17, 1934, and Mar 18, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933
New England States								
Maine			1	1	30	3	0	1
New Hampshire				4	223		0	0
Vermont	1	1			54	4	0	0
Massachusetts	13	16		6	2,003	341	0	0
Rhode Island		3		2	5	3	0	0
Connecticut	6	4	15	12	38	159	1	1
Middle Atlantic States								
New York	35	49	[1] 29	[1] 21	1,223	4,041	2	1
New Jersey	13	40	13	22	514	1,536	3	1
Pennsylvania	59	70			3,697	1,056	2	5
East North Central States.								
Ohio	38	30	144	216	1,384	597	2	1
Indiana	22	26	57	65	435	152	1	8
Illinois	28	28	37	104	1,419	399	4	23
Michigan	10	33	5	6	86	1,353	1	2
Wisconsin	7	3	55	90	139	494	2	2
West North Central States								
Minnesota	5	3	2	3	224	1,322	0	0
Iowa [2]	6	9	7		160	9	1	5
Missouri	48	23	153	18	1,010	275	1	15
North Dakota	10	2	29		173	70	1	1
South Dakota	2	12	6		478	4	0	0
Nebraska	3	12	9	15	257	6	0	0
Kansas	15	7	1		255	334	0	2
South Atlantic States								
Delaware	3	11			181	5	0	0
Maryland [2]	10	7	25	36	776	3	0	1
District of Columbia	8	4		3	606	3	0	0
Virginia	21	13			1,697	473	7	3
West Virginia	14	10	55	31	45	143	1	0
North Carolina	16	15	61	69	3,369	506	1	0
South Carolina	17	4	757	708	572	217	0	0
Georgia [3]	11	9		184	1,490	40	1	1
Florida	2	7	7	13	235	40	0	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar 17, 1934, and Mar 18, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933
East South Central States								
Kentucky	25	11	69	51	481	80	1	0
Tennessee	12	3	161	100	1,425	30	5	3
Alabama	9	15	125	120	832	25	1	1
Mississippi [2]	8	7					0	0
West South Central States								
Arkansas	3	6	35	61	374	112	0	2
Louisiana	26	12	8	7	293	56	1	5
Oklahoma [4]	10	15	78	104	1,025	34	1	1
Texas [3]	113	63	652	117	3,106	750	6	3
Mountain States								
Montana	1	3		10	18	31	0	1
Idaho	5	1		1	74	24	0	0
Wyoming		1			54	8	0	0
Colorado	5	7		43	214	9	0	2
New Mexico	5	7	2		124	16	0	1
Arizona		1	31	2	55	15	0	0
Utah [2]		2			608	2	0	1
Pacific States								
Washington	2	1			155	51	0	0
Oregon [5]	3	1	87	30	70	81	0	0
California	26	53	48	61	1,363	1,146	3	1
Total	676	660	2,764	2,336	33,049	16,058	49	96

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933
New England States								
Maine	0	0	25	13	0	0	1	1
New Hampshire	0	0	12	26	0	0	0	0
Vermont	0	0	18	13	0	0	0	0
Massachusetts	0	0	275	417	0	0	1	3
Rhode Island	0	0	14	46	0	0	0	0
Connecticut	0	0	92	176	0	3	0	0
Middle Atlantic States								
New York	1	1	902	1,120	0	0	10	8
New Jersey	0	0	206	364	0	0	5	1
Pennsylvania	0	0	834	1,071	0	0	9	6
East North Central States								
Ohio	1	1	978	1,095	0	16	2	4
Indiana	1	0	229	128	2	1	0	2
Illinois	1	1	663	546	3	15	0	0
Michigan	0	1	876	608	11	1	5	2
Wisconsin	1	0	277	119	35	4	0	1
West North Central States								
Minnesota	0	0	69	76	3	0	0	1
Iowa	0	0	86	35	11	36	0	0
Missouri	0	0	125	86	15	6	1	1
North Dakota	2	0	41	10	4	2	0	0
South Dakota	0	1	13	9	4	0	0	1
Nebraska	0	0	28	39	4	1	5	0
Kansas	0	0	111	57	3	0	1	3
South Atlantic States								
Delaware	0	0	19	10	0	0	0	0
Maryland	0	0	79	111	0	0	3	2
District of Columbia	0	0	14	28	0	0	0	1
Virginia	1	0	45	40	0	0	2	10
West Virginia	0	1	58	27	0	0	1	6
North Carolina	1	1	42	49	0	5	3	6
South Carolina	0	2	5	4	0	0	3	4
Georgia [3]	1	0	6	12	0	10	5	1
Florida	1	1	5	5	0	0	4	5

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 17, 1934, and Mar. 18, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933	Week ended Mar 17, 1934	Week ended Mar 18, 1933
East South Central States								
Kentucky	1	0	108	54	0	1	3	3
Tennessee	0	0	29	38	2	2	4	5
Alabama	1	0	12	15	0	1	3	5
Mississippi [1]	0	0	25	6	0	0	8	3
West South Central States								
Arkansas	0	0	8	7	2	8	1	0
Louisiana	0	0	24	19	5	2	10	17
Oklahoma [4]	0	0	10	33	3	8	5	2
Texas [3]	0	2	133	39	35	36	10	7
Mountain States								
Montana	0	0	18	7	0	0	2	5
Idaho	0	0	2	6	3	10	0	2
Wyoming	0	0	7	11	0	0	0	4
Colorado	0	0	26	34	15	0	0	2
New Mexico	0	0	20	16	2	0	3	1
Arizona	0	0	20	16	0	1	0	0
Utah [2]	0	0	6	10	0	0	0	1
Pacific States								
Washington	1	0	60	37	11	3	1	1
Oregon [5]	0	0	31	16	10	2	2	0
California	6	1	207	178	17	24	5	7
Total	20	13	6,893	6,882	200	198	118	135

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended Mar 17, 1934, 10 cases, as follows Georgia, 7, Texas, 3
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended Mar 17, 1934, Oregon, 3 cases

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1934										
Indiana	7	131	303	0	2,191		1	1,040	7	10
Maryland	1	39	123	0	1,408		0	322	0	9
Michigan	5	45	21	5	243		4	2,351	15	17
Missouri	15	230	690	7	5,991		3	707	35	20
New Jersey	3	65	94	0	1,489		2	764	0	11
New Mexico	4	26	29	21	438		1	118	1	10
New York	17	168		9	3,740		4	2,910	0	22
North Dakota	1	23	89	0	604		0	130	1	0
Ohio	9	144	306	4	2,853		1	2,805	2	24
South Carolina		91	3,136	220	1,877	85	3	35	5	19

February 1934

	Cases
Anthrax	
New Jersey	1
New York	1
Chicken pox	
Indiana	475
Maryland	653
Michigan	1,309
Missouri	790
New Jersey	1,720
New Mexico	135
New York	2,863
North Dakota	93
Chicken pox—Contd.	
Ohio	2,368
South Carolina	148
Conjunctivitis	
New Mexico	3
Dengue	
South Carolina	4
Diarrhea	
Maryland	1
South Carolina	308
Diarrhea and enteritis:	
Ohio (under 2 years)	23
Dysentery	
Indiana (amoebic)	1
Maryland	7
Michigan	13
Missouri	12
New Jersey	3
New Mexico	1
New York (amoebic)	13
New York (bacillary)	14
Ohio	5
Food poisoning:	
Ohio	14

	Cases
German measles	
Maryland	46
Michigan	172
New Jersey	26
New Mexico	16
New York	104
Ohio	1,848
Hookworm disease	
South Carolina	71
Impetigo contagiosa	
Maryland	13
Lead poisoning	
Ohio	13
Lethargic encephalitis	
Michigan	4
Missouri	7
New Jersey	6
New Mexico	1
New York	3
Ohio	4
South Carolina	1
Mumps	
Indiana	96
Maryland	219
Michigan	638
Missouri	482
New Jersey	296
New Mexico	68
North Dakota	5
Ohio	378
South Carolina	255
Ophthalmia neonatorum	
Maryland	2
New Jersey	1
New Mexico	1

Ophthalmia neonatorum—Continued	Cases
Ohio	69
South Carolina	11
Paratyphoid fever	
New York	5
South Carolina	2
Puerperal septicemia	
New Mexico	2
Ohio	7
Rabies in animals	
Indiana	33
Maryland	1
Missouri	24
New Jersey	14
New York	1
South Carolina	24
Scabies	
Maryland	2
Septic sore throat	
Maryland	9
Michigan	64
Missouri	91
New Mexico	6
New York	79
Ohio	373
Tetanus	
Maryland	1
New York	3
Ohio	2
Trachoma	
Maryland	1
Trichinosis	
New Jersey	14
New York	20
Ohio	1

	Cases
Tularaemia	
Missouri	1
New Mexico	1
Ohio	1
South Carolina	5
Typhus fever	
Maryland	1
New York	1
South Carolina	2
Undulant fever	
Maryland	2
Michigan	12
New Jersey	2
New York	28
Ohio	4
South Carolina	2
Vincent's infection	
Maryland	12
Michigan	20
New York	82
North Dakota	13
Whooping cough	
Indiana	244
Maryland	771
Michigan	1,008
Missouri	607
New Jersey	567
New Mexico	148
New York	1,346
North Dakota	80
Ohio	1,753
South Carolina	446

AN OUTBREAK OF PSITTACOSIS IN PITTSBURGH, PA.

From February 14 to March 16, 1934, 25 cases of psittacosis or suspected psittacosis, with 10 deaths, occurred in Pittsburgh, Pa. The outbreak originated in a store where birds are sold. The city health department has requested all dealers to isolate parrots, parrakeets, and other birds of the psittacine family and to refrain from selling these birds at this time.

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar 10, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	1	7	2	0	0	0	17	33
New Hampshire											
Concord	0	------	0	75	1	1	0	1	0	0	8
Manchester	0	------	1	10	1	3	0	0	0	0	12
Nashua	0	------	0	4	0	2	0	0	0	0	------
Vermont											
Barre	0	------	0	0	0	0	0	0	0	0	1
Burlington	0	------	0	0	0	0	0	0	0	12	8
Massachusetts											
Boston	2	------	1	404	36	67	0	17	0	122	273
Fall River	2	------	1	0	3	3	0	0	0	4	34
Springfield	0	------	0	3	3	3	0	4	0	10	36
Worcester	1	------	0	17	6	19	0	1	0	13	71
Rhode Island											
Pawtucket	1	------	0	0	0	0	0	0	0	0	14
Providence	3	------	0	7	9	17	0	3	0	6	83
Connecticut.											
Bridgeport	0	1	0	4	1	12	0	1	0	0	40
Hartford	0	------	1	0	3	8	0	3	0	0	45
New Haven	0	1	1	1	4	2	0	1	1	2	43

City reports for week ended Mar. 10, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New York											
Buffalo	0		1	215	16	29	0	10	0	34	133
New York	43	22	16	86	241	338	0	112	9	117	1,861
Rochester	1		0	1	3	39	0	0	0	10	64
Syracuse	0		0	0	12	4	0	0	0	48	69
New Jersey											
Camden	2	4	1	123	2	3	0	0	0	1	36
Newark	1	7	1	5	14	30	0	8	0	49	125
Trenton	0	2	0	53	5	13	0	3	0	0	37
Pennsylvania											
Philadelphia	7	5	4	1,418	70	116	0	37	0	42	619
Pittsburgh	3	19	6	175	38	30	0	4	0	28	210
Reading	0		0	3	2	10	0	1	0	7	19
Scranton	0		0	1	0	6	0	0	0	4	
Ohio											
Cincinnati	1		3	69	19	25	0	11	0	20	187
Cleveland	5	43	1	59	34	147	0	14	0	168	214
Columbus	3	3	3	0	7	83	0	4	0	30	81
Toledo	1	2	1	168	4	44	0	9	0	88	77
Indiana											
Fort Wayne	1		0	11	2	19	0	2	0	1	30
Indianapolis	2		0	302	12	22	0	6	1	59	
South Bend	0		0	1	1	8	0	0	0	0	16
Terre Haute	0		0	4	4	1	0	0	0	0	16
Illinois											
Chicago	0	4	3	135	55	278	0	43	1	228	745
Springfield											
Michigan											
Detroit	6	5	5	33	52	218	0	17	1	130	314
Flint	2		0	18	9	87	0	0	0	9	27
Grand Rapids	0		0	2	2	47	0	0	0	5	36
Wisconsin											
Kenosha	0		0	1	0	42	0	0	0	5	7
Madison	1			5		10	0		0	42	13
Milwaukee	1	1	1	7	6	157	0	5	0	95	108
Racine	1		0	2	0	8	1	0	0	3	12
Superior	0		0	1	1	1	0	0	0	0	10
Minnesota											
Duluth	0		0	0	4	1	0	1	0	1	31
Minneapolis	4		1	5	10	24	0	3	0	35	110
St. Paul	0		0	2	8	9	3	6	0	16	80
Iowa											
Des Moines	0			1		10	0		0	0	33
Sioux City	1			21		1	0		0	0	
Waterloo	0			0		0	0		0	14	
Missouri											
Kansas City	0		1	6	16	24	0	9	0	24	101
St. Joseph	1		0	12	2	1	0	0	0	0	9
St. Louis	16	3		345	18	23	0	15	0	68	250
North Dakota											
Fargo	0		0	102	2	2	0	0	0	3	9
Grand Forks	0		0	0	0	1	0	0	0	0	
South Dakota											
Aberdeen	0		0	8	0	0	0	0	0	9	
Sioux Falls	0		0	17	0	0	0	0	0	0	7
Nebraska											
Omaha	1		0	146	11	8	3	2	0	7	72
Kansas											
Topeka	0		0	1	6	6	0	1	0	30	21
Wichita	0	1	1	5	5	15	0	0	0	6	31
Delaware											
Wilmington	0		0	126	5	4	0	0	0	4	30
Maryland											
Baltimore	4	6	2	488	35	34	0	10	0	192	234
Cumberland	1	1	0	0	2	1	0	1	0	1	12
Frederick	0		0	17	0	4	0	0	0	0	5
District of Columbia											
Washington	10	1	0	555	19	17	0	17	0	29	152
Virginia											
Lynchburg	3		0	1	1	1	0	0	0	6	10
Norfolk	0		0	110	5	0	0	1	0	2	49
Richmond	1	1	0	110	10	4	0	3	0	2	52
Roanoke	0		0	0	0	0	0	0	0	0	23
West Virginia											
Charleston	1	3	0	0	3	0	0	1	0	0	12
Huntington	0		0	0	0	5	0	0	0	0	
Wheeling	0		1	3	2	11	0	0	1	15	20

City reports for week ended Mar 10, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Carolina											
Raleigh	0	------	0	21	0	0	0	0	0	15	11
Wilmington	1	------	0	3	1	0	0	1	0	3	17
Winston-Salem	2	------	0	79	3	4	0	2	0	0	25
South Carolina											
Charleston	0	43	1	34	5	1	0	2	2	7	33
Columbia	0	------	0	0	6	0	0	1	0	0	7
Greenville	0	------	0	2	2	0	0	1	0	12	12
Georgia											
Atlanta	5	30	3	351	11	2	0	7	0	2	97
Brunswick	0	------	0	100	1	0	0	0	0	1	5
Savannah	0	69	3	153	3	2	0	2	1	0	34
Florida											
Miami	0	------	0	24	4	0	0	6	0	6	36
Tampa	3	------	0	20	1	1	0	0	0	0	20
Kentucky											
Ashland	0	------	------	1	------	0	0	------	0	3	------
Lexington	2	14	0	3	2	0	0	2	0	2	17
Louisville	2	2	0	5	17	23	0	0	1	26	78
Tennessee											
Memphis	0	------	1	309	23	6	1	4	2	4	118
Nashville	3	------	2	121	7	3	0	1	0	31	65
Alabama											
Birmingham	1	2	3	71	12	2	0	3	0	1	66
Mobile	1	2	1	20	0	0	0	1	0	0	31
Montgomery	2	1	------	68	------	0	0	------	0	6	------
Arkansas											
Fort Smith	0	------	------	27	------	2	0	------	0	0	------
Little Rock	1	------	0	78	2	0	0	1	0	6	4
Louisiana											
New Orleans	24	5	3	25	8	12	0	9	7	2	132
Shreveport	1	------	0	4	3	3	0	0	1	0	22
Oklahoma											
Tulsa	0	------	------	215	------	1	0	------	0	0	------
Texas											
Dallas	7	------	1	11	7	13	0	3	0	3	47
Fort Worth	2	------	1	0	8	5	0	3	0	7	42
Galveston	0	------	0	0	2	3	0	1	0	0	11
Houston	6	------	2	3	13	14	3	6	0	0	77
San Antonio	4	------	4	7	8	9	0	4	0	0	67
Montana											
Billings	0	------	0	0	0	1	0	0	0	0	10
Great Falls	0	------	0	0	4	0	0	0	0	0	7
Helena	0	------	0	0	0	0	0	0	0	0	3
Missoula	0	------	0	0	2	0	0	0	0	0	5
Idaho											
Boise	1	------	0	2	3	0	0	0	0	0	7
Colorado											
Denver	4	39	2	131	13	14	0	3	0	109	71
Pueblo	0	------	0	1	2	2	0	1	0	11	16
New Mexico											
Albuquerque	1	------	0	2	3	3	0	2	0	4	13
Utah											
Salt Lake City	1	------	0	320	5	6	0	0	0	21	31
Nevada											
Reno	0	------	0	1	0	0	0	0	0	0	3
Washington											
Seattle	0	------	4	2	7	25	1	10	1	75	110
Spokane	0	1	1	44	2	3	0	------	0	7	22
Tacoma	0	------	0	28	0	0	0	0	0	15	23
Oregon											
Portland	1	2	0	11	1	11	0	4	0	4	71
Salem	0	5	0	0	0	0	0	0	0	0	------
California											
Los Angeles	17	12	0	51	15	62	0	23	0	57	321
Sacramento	0	------	0	2	4	0	0	2	0	4	24
San Francisco	6	2	1	112	8	16	0	12	0	14	153

City reports for week ended Mar 10, 1934—Continued

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Connecticut				Nebraska			
Bridgeport	1	1	0	Omaha	0	1	0
New York				Maryland			
New York	4	1	1	Baltimore	0	1	0
Pennsylvania				Alabama			
Philadelphia	0	0	1	Birmingham	1	0	0
Indiana				Mobile	1	1	0
Indianapolis	2	1	0	Texas			
Illinois				Galveston	0	1	0
Chicago	1	0	0	California			
Michigan				Los Angeles	2	0	0
Detroit	1	1	0				
Missouri							
St Louis	2	0	0				

Lethargic encephalitis—Cases Portland, Maine, 1, Cleveland, 2, St Paul, 1

Pellagra—Cases Charleston, S C, 2, Savannah, 1, Miami, 1, Mobile, 1, Los Angeles, 1, Sacramento, 1; San Francisco, 1

Typhus fever—Cases Atlanta, 2, Mobile, 2 Deaths Atlanta, 1

FOREIGN AND INSULAR

CANADA

Ontario Province—Communicable diseases—4 weeks ended February 24, 1934.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 4 weeks ended February 24, 1934, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	3		Paratyphoid fever	1	
Chicken pox	932		Pneumonia		128
Diphtheria	35	1	Poliomyelitis	1	
Erysipelas	13	1	Scarlet fever	539	3
German measles	17		Syphilis	164	
Gonorrhea	155		Trench mouth	1	
Influenza	48	2	Tuberculosis	151	38
Lethargic encephalitis	1	1	Typhoid fever	15	
Measles	77		Undulant fever	9	
Mumps	474		Whooping cough	393	4

CUBA

Provinces—Notifiable diseases—4 weeks ended October 28, 1933.—During the 4 weeks ended October 28, 1933, cases of certain notifiable diseases were reported in the provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer		1	1	4		1	7
Diphtheria		4	1	1		1	7
Hookworm disease	1						1
Malaria	442	30	272	391	95	494	1,724
Measles			1				1
Poliomyelitis			1				1
Tuberculosis	9	23	15	58	59	45	209
Typhoid fever	32	11	13	57	23	21	157

YUGOSLAVIA

Communicable diseases—January 1934.—During the month of January 1934, certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	31	4	Poliomyelitis	5	
Cerebrospinal meningitis	6	2	Scarlet fever	285	13
Diphtheria and croup	842	106	Sepsis	11	4
Dysentery	18	2	Tetanus	5	5
Erysipelas	187	13	Typhoid fever	202	39
Measles	530	14	Typhus fever	298	11
Paratyphoid fever	20				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources. The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given

CHOLERA

[C indicates cases, D, deaths, P, present]

Place		July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Oct 1–28, 1933	Oct 29–Nov 25, 1933	Week ended— December 1933 2	9	16	23	30	January 1934 6	13	20	27	February 1934 3	10	17	24	Mar 3, 1934
China: Hankow	C	1	1																
India	C	7,695	14,422	9,939	7,571	1,944	1,999	1,584	1,364	1,270	978	1,417	1,409						
	D	3,237	6,654	4,846	3,923	957	906	700	613	623	503	815	519						
Bombay Presidency	C	3,604	3,111	1,376	1,100	383	370	184	129	138	138	109	78	109	78				
	D	1,436	1,112	634	594	188	201	105	76	69	65	59	40	67	42				
Bombay	C	1	5	4	1	4					1								
Calcutta	C	59	93	68	55	10	13	12	6	22	15	14	29	20	37	16	41	32	40
Chittagong	C	1		1		1		1	2			2							
Madras Presidency	C	923	1,058	727	1,039	346		739	905	718	490	282	362						
	D	338	444	292	453	153		263	335	261	206	112	130						
Madras	C			4	6	61	25	6	20	9	4	4	6	2		6	9		
	D			1	4	26	11	4	9	6	2	2		2		1	5		
Vizagapatam	C			1															
India (French):																			
Chandernagor	D		2																
Karikal	C		1					1	1			1	2	2					
Pondichery	C	2																	
India (Portuguese)	C										1								
Indo-China (see also table below) Saigon and Cholon	C	2																	
Philippine Islands [1]																			
Antique Province	C			17	8	8													
	D			16	6	6													
Bohol Province	C	1	6	87	173	51	23	22	11	33	78	63	93	58	30	29	66	95	62
	D		3	47	101	25	16	16	10	27	59	37	66	38	21	19	41	61	41
Cebu Province	C	26	39	63	71	15	10	1	6	43	12	12	6	4	1				
	D	20	28	36	45	10	9	1	3	31	8	12	7	3	1				
Cebu	C	1	9	21	17								1		1				
	D	1	7	8	8								1		1				
Naga	C				18	4						2							
	D				9	3						1							
Iloilo Province	C			12	2							1							

	D			11	3							1							
Iloilo	C				2														
	D				3														
Leyte Province	C	2	1																
	D	2	1																
Occidental Misamis Province	C		1															1	
	D		1																
Occidental Negros Province	C	1				2	2			5	8		9	10		7	5	1	
	D	1				1	2			3	5		10	8		4	6	1	
Oriental Negros Province	C						1	4	1		23	21	37	15	13	4	27	3	12
	D						1	4	1		14	9	21	8	10	2	19	3	7
Samar Province	C	31	[2] 32	[3] 20															
	D	20	[2] 20	[3] 14															
Siam	C														1				
Bangkok	C																	1	

Place		July 1933			August 1933			September 1933			October 1933			November 1933			December 1933	
		1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20
Indo-China (French) (see also table above)																		
Cambodia [4]	C	3	1			1												
	D	3	1			1												
Cochin-China [4]	C	6	2	12	3	2	1	1	2	2	5	5					2	1
	D	5	2	3	3	2	1	1	2	2	5	3					2	1

[1] During the week ended Mar 17, 1934, cholera was reported in the Philippine Islands as follows Bohol Province Inabanga, 4 cases, 2 deaths, Jetafe, 2 cases, Loon, 1 case, Tubigon, 6 cases, 5 deaths Occidental Negros Province Silay, 2 cases, 1 death Oriental Negros Province Bais, 1 case, 1 death, Tanjay, 4 cases, 4 deaths Samar Province Calbayog, 18 cases, 18 deaths

[2] For 2 weeks

[3] For the month of October

[4] Reports incomplete

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE [1]

[C indicates cases, D, deaths, P, present]

Place		July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Oct 1–28, 1933	Oct 29–Nov 25, 1933	Week ended— December 1933: 2	9	16	23	30	January 1934: 6	13	20	27	February 1934: 3	10	17	24
Angola [2]																		
Argentina (see also table below) Buenos Aires Province	C														1			
	D															1		
Azores																		
Fayal	C		1															
St Michaels	C		7															
Bolivia (See table below)																		
British East Africa (see also table below)																		
Kenya	C	13	30	18	37	4	4	2	3	8	5		9	5				
Tanganyika	D				1													
Uganda	C	77	113	63	81	19	25	11	14	8	13	16	5					
	D	77	109	61	79	16	23	11	13	9	12	16	5					
Ceylon Colombo	C		1	1		1								1			1	2
	D		1	1		1								1			1	1
Plague-infected rats		1					1						1	2	3			1
China Manchuria [3]																		
Dutch East Indies West Java	C	899	1,465	[4] 816	1,568	411	432	401	427									
	D	898	1,463	[4] 814	1,560	409	432	398	427									
Ecuador (See table below)																		
Egypt:																		
Alexandria	C	1								1								
Asyut	C												1		2	1	1	
Faiyum	C		2	1									1					
Gharbiya	C		3	2									1					
	D		2	3									1					
Girga	C															3		
Minya	C		1															
Qena	C	1																
Luxor	C	2																
France Marseille	C	8																
	D	3																
Plague-infected rats		2			1													
Hawaii Territory Hawaii Island—Hamakua—Plague-infected rats			1		2	1		2	1	1		1						

India	C	6,209	13,642	11,755	11,037	3,194	2,487	2,540	2,244	2,222	4,196	4,054	3,907					
	D	3,560	7,971	6,430	5,921	1,749	1,361	1,535	1,450	1,243	2,760	2,594	2,431					
Bassein	C	7	3				1				2	2	1					3
Plague-infected rats		1						1	1									1
Bombay Presidency	C	3,971	8,069	4,922	5,799	1,342	1,196	966	830	1,167	1,328	1,181	1,274	1,123	1,127			
	D	2,313	5,117	2,928	3,621	850	810	659	547	689	856	860	761	758	719			
Bombay	C	1	7	3	1					1		1			5	6	5	1
Plague-infected rats		5	3	1	8			1							2	2	4	1
Poona	C			475	61													
	D			527	53													
Calcutta	C							[5] 1										
	D							[5] 1										
Madras Presidency	C	867	1,181	521	537	144		136	123	273	255	248	213					
	D	395	547	294	257	56		62	54	145	139	126	142					
Rangoon	C		2	1	1										3	1	3	
Plague-infected rats		1	2		2		1	1	1		1					1	2	1
Indo-China (see also table below)																		
Pnom-Penh	D	3	2	2				1					1		1			
Saigon and Cholon	C	3										1						
Iraq Baghdad	C		3	1	2		1		2	2		1			1	1		
Libya	C		10				9			2				2				
	D		3				5			1				1				
Madagascar (see also table below) Tamatave	C	1																
Peru (See table below)																		
Portuguese West Africa	C															P		
Senegal. (See table below.)																		
Siam	C	1													3			
South-West Africa [6]																		
Union of South Africa:																		
Cape Province	C				18			3						13				
Orange Free State	C								1									
Transvaal	C					1												
United States California:																		
San Benito County—Plague-infected ground squirrels		8																
Santa Clara County—Plague-infected ground squirrels						1												
Whittier	C	1																
	D	1																
On vessel S S Angkor at Beirut from Marseille	C			1														

[1] Including plague in the United States and its possessions.
[2] During December 1933 and January 1934, 32 cases of plague with 17 deaths were reported in Angola
[3] A report dated Nov 13, 1933, states that plague was reported in Manchuria, China, as follows Fengtien Province, 249 cases, Hsingan Province, 200 cases, Jehol Province, 81 cases, Kirin Province, 479 cases
[4] For 2 weeks.
[5] Imported.
[6] 116 cases of plague with 5 deaths were reported in Ovamboland, South-West Africa, from Jan 1 to Dec. 2, 1933. Antiplague measures have been taken.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases, D, deaths, P, present]

Place		August 1933	September 1933	October 1933	November 1933	December 1933	January 1934
Argentina (see also table above)	C			6	4		
	D			2	1		
Bolivia	C	1			5		
British East Africa (see also table above)							
Kenya	C	13	26	20	36	14	19
Uganda	C	91	97	71	83	63	49
Ecuador	C		3				
Indo-China (see also table above)							
Cambodia	D	6	16	8	2	1	2
Cochin-China	C	5	1			1	1
Madagascar	C	100	77				
	D	92	73				
Peru	C	7	8	18	19	12	7
Callao	C		1	7			
Senegal							
Dakar [7]	C		5	4	15	3	1
	D		3	9	10	3	1
Medina [7]	C			1	1	1	
	D			1	1	1	
Tivaouane [7]	C	5	2				

[7] Incomplete reports

SMALLPOX

Place		July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Oct 1–28, 1933	Oct 29–Nov 25, 1933	Week ended— December 1933: 2	9	16	23	30	January 1934: 6	13	20	27	February 1934: 3	10	17	24	Mar 3, 1934
Algeria																			
Algiers Department	C				1									2		1			
Constantine Department	C													1					
Angola (See table below)																			
Arabia. (See table below)																			
Belgian Congo	C		4								4								
Bolivia (See table below)																			
Brazil																			
Porto Alegre (alastrim)	C	1	12	5	1	1					1								
Santos	C									4		2							
British East Africa																			
Kenya	C											1	1	65					
Tanganyika	C	21	30	52	202	6	22	14	16	13	20	13		6					

British Somaliland	C											8	7	3	9	3			
British South Africa																			
Northern Rhodesia	C	1		16		114			2										
Southern Rhodesia	C		2																
Canada:																			
Alberta	C									1									
Manitoba	C	1																	
Ontario	C				1									1 [1]					
Prince Edward Island	C					1 [1]													
Quebec	C					1						1							
Saskatchewan	C		1																
Ceylon: Colombo	C	9			1														
China:																			
Amoy	C											1	1						
Canton	C				2	1	1	1	2	1	5	5	3	1		1	4	2	
Dairen	C		1	3	17	35	28	18	22	24	24	44			100				
Hangchow	C	1			1			1	1			2							
Hankow	C		3			1	1												
Hong Kong	C	1			1			1	1				1	2	2		5	9	13
Kwangtung Leased Territory	C													38	51				
Macao	C																3	1	2
Manchuria—Mukden [2]																			
Nanking	C					1									1				
Shanghai	C	10	5	3	17	3	6	10	17	21	12	29	27	40	29	26	30	28	43
South Manchuria Railway Zone	C													58	57				
Swatow	C			2	1							1							
Tientsin	C									1									
Costa Rica (See table below.)																			
Dahomey (See table below.)																			
Ecuador (See table below.)																			
Egypt:																			
Alexandria	C				3						1	1	1	2	1			2	
Aswan	C											7	3	24		19			
Asyut	C	109	43	40	7	11		9	9	1		3		4					
Beni-Suef	C		31	13															
Cairo	C		1						1									1	
Dakahliya	C	1						1	32	24		7	1	4					
Faiyum	C	18	3	1	13			3											
Gharbiya	C	39	5	2	7	3		4	1										
Girga	C	2		9		16		4				6	3	8		5			
Minya	C								10	22		48	71	53		68			
Qena	C	25	4	25	28	7		11	5	1		5		1		5			
Provinces	C	297	150	95	168	65	55	39	58	48	117	77	79	96	108	103			
Great Britain:																			
England and Wales	C	32	20	10	9	3	9	4	9	2	3	13	7	9	8	16	20	23	11
Blackburn	C													1			13	7	2
	D														1			3 [1]	
London	C	28	14	10	9	3	9	4	9	2	3	13	7	8	8	16	16	15	9
London and Great Towns	C	31	15	10	9	3	9	4	9	2	3	13	7	9	8	16	19	23	11

[1] For 2 weeks.
[2] From Jan. 1 1934, to Feb. 9, 1934, 140 cases of smallpox with 17 deaths were reported in Mukden, Manchuria, China.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths, P, present]

Place		July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Oct 1–28, 1933	Oct 29–Nov. 25, 1933	Week ended— December 1933, 2	9	16	23	30	January 1934, 6	13	20	27	February 1934, 3	10	17	24	Mar 3, 1934
Greece (see also table below) Salonika	C		9													3	3		
India	C	7,069	7,052	4,699	5,677	2,047	1,978	2,077	2,049	2,673	2,053	3,150	2,781						
	D	1,768	1,625	1,079	1,232	500	424	497	522	764	507	718	569						
Bassein	C	10	19	12	12	4	1	10	1	17	9	11	24	18	23	17	13	17	11
	D	6	6	7	6	3		3	2	3	8	3	7	8	3	8	6	4	4
Bombay Presidency	C	1,029	873	599	673	232	227	273	328	325	411	293	410	477	448				
	D	186	160	91	115	40	35	60	80	71	74	59	94	109	90				
Bombay	C	14	1	4	4	3	2	2	5	8	4	6	8	13	26	11	8	11	10
	D	8	1	4	3	3	2	1	2	5	1	2	4	4	7	7	5	5	5
Calcutta	C	18	10	8	13	9	8	9	6	43	31	42	46	62	80	100	105	81	76
	D	8	3	3	5	1	5	6	4	26	20	24	34	37	48	58	78	61	56
Cochin	C		2	1								5	6	1	5	4	1	1	1
Karachi	C	5		2	1		2		1	[3] 1	3	4	4	4	3	4	8	6	14
Madras Presidency	C	2,851	2,944	2,432	2,479	637		611	617	432	660	857	1,300						
	D	587	513	507	447	110		101	75	86	133	149	182						
Madras	C	223	209	81	41	14	17	13	11	28	20	22	51	20	24	23	27	21	16
Negapatam	C	21	8	9	17	8	5	3	3	1			3	1					
Rangoon	C	1	4	1	2	2	1	2	3	1	4	5	1	4	8	2	9	9	2
Tuticorin	C	2		1	6								4			6			
Vizagapatam	C	11	2	1	2		1	1	1			1	1	2	1	5	6	1	5
India (French):																			
Chandernagor	D										1	1	3						
Karikal	C		1	1	3	3		1	6	1	1		1						
	D		1	1	3	1		1	3	1	1		1						
Pondichery	C	181	210	101	71	26	10	14	18	25	24	28	8	16	28				
	D	70	104	63	32	12	8	10	9	11	11	15	8	9	11				
Indo-China (see also table below):																			
Haiphong	C										34	20	23	37	31	5	41	34	19
Saigon and Cholon	C		1					1											
Iraq	C	22	8	36	135	3	28	3			10	7			17				
Amara Liwa	C												19						
Baghdad	C			2	3	1	1	1			1		1		1	1	1		2
Basra	C		4		3			1											
Japan																			
Osaka	C																1		1
Tokyo	C												1						

Mexico (see also table below)																			
Chihuahua	D															1			
Guadalajara	D															1			
Juarez [4]																			
Mexico, D F	C	12																	
Monterrey	D	1			1				1								1		
Saltillo	D								1	1									
San Luis Potosi	D	8										1							
Tampico	C										1	1							
Torreon	D		1	2															
Vera Cruz	C			1	1														
Morocco. (See table below)																			
Nigeria	C	361	113	166	509	57			127		39								
Nyasaland (See table below)																			
Palestine	C																		10
Persia	C	20	20	45	12	6	3	16											
	D	7	11	5	5	1	1												
Teheran	C	17	3	11	8		1	2			4	1	2	1	5	1	2		
	D	5	1	4	2		1	1			3		1	1	3		1		
Peru. (See table below)																			
Poland	C			1	1														
Portugal (see also table below)																			
Lisbon	C	3	3		1						4		1		2		1	1	
Oporto	C	1		2	2											2			
Siam	D	1																	
Sierra Leone	C	6	250	534	578		[1] 84		[1] 172		[1] 70		[1] 73		[1] 162				
Spain	C	29	16	11	40						3	7	8	5		3	6		
Sudan (Anglo-Egyptian)	C		1		15		15	5	1	40	17		8	9	13	41	6	6	14
Syria:																			
Beirut	C	21							12	8	12	20	19	10	12	8	13	12	7
Provinces	C	11	7	34	35	6	18		19	1	11	30	30	30	8	14	12	4	
Turkey (See table below)																			
On vessels																			
S S. Arracan at Newport	C	1																	
S S Clan Macquarrie at Suez	C		1																
S S. Sikh at Madras	C	1																	
S S. Lichtenfels at Suez from Calcutta	C		1																
S.S. Shahjehan at Madras	C		1																
S.S. Rohna at Penang from Madras	C				1														
S.S. Enterprise at Karachi	C					1													
S S Jaldurga at Rangoon from Gogalpore	C					1													
S S. Pembrokeshire at Hong Kong	C						P												
S S. Cremer at Singapore from Penang and Belawan	D								1										
S.S. Jufuku Maru at Chefoo from Dairen	C											P							
S.S. Haiching at Amoy	C												P						
S S Elysia at Suez from Bombay	C														1				
S.S. Red Sea at Colombo from Singapore	C														[5] 2				

[1] For 2 weeks
[3] Imported.
[4] Dec. 18, 1933. 90 cases of smallpox were reported in Juarez, Mexico, with 18 deaths occurring from Dec 1 to 16, 1933
[5] Includes 1 suspected case.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths, P, present]

Place		August 1933	September 1933			October 1933			November 1933			December 1933			January 1934
			1–10	11–20	21–30	1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20	21–31	1–10
Dahomey	C	8	20	6	1	2	8	15	9	9	5				
	D	2	5	1			6		6	6					
Indo-China (see also table above)	C	79		44	37	39	20	78	24	22	11	54	65	63	92
	D	23		19	13	15	5	18	10	8		10	12	7	14

Place		August 1933	September 1933	October 1933	November 1933	December 1933	January 1934	Place		August 1933	September 1933	October 1933	November 1933	December 1933	January 1934
Angola	C		4					Mexico (see also table above)	C	31	18			7	
Arabia	C					20		Morocco	C	1	2	3	16		1
	D					14		Nyasaland	C	347	318	289	391	132	130
Bolivia	C	12	15	34	39	21		Peru	C	56	90	23	21	25	
Costa Rica	C	2			3			Portugal (see also table above)	C	89	105	214	323	128	
Ecuador	C	1	10				4		D	16	27	31	21	16	
Greece (see also table above)	C	1		1	2			Turkey	C	8	56		12	17	

TYPHUS FEVER

Place		July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Oct. 1–28, 1933	Week ended—															
					November 1933				December 1933					January 1934				February 1934		
					4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17
Algeria:																				
Algiers Department	C	2		1					9											1
Constantine Department	C	21	16	5			1	7	1	2	3		1	2	6	1	2	5	3	5
Bone	C	1			1									1	1					
Oran Department	C		2	1					1											
Basutoland (See table below)																				
Bolivia. (See table below)																				
British East Africa. Uganda	C	4	11	2	1	1					3		2			1				
Bulgaria	C	3	1	3	1		1	1	3			5		7	3	8	7	16		
Chile	C	1,028	2,588	2,620	549	736	813	666	595	612	511	520	476	368	308					
Antofagasta	C												4							
San Pedro [1]																				
Santiago	C	392	1,071	1,159	244	335	335	297	262	286	200	213	195	156	141	108	127	98	78	61
Valparaiso	C	13	34	43	5	12	24	13	11	8	17	11	11	4	5	2	4	3	4	2
China:																				
Hangchow	C	5																		
Hankow	C		1					1	1											
Harbin	C	11	1																	
Kwantung Leased Territory	C	1								2	2									
Nanking	C	1		1																
Shanghai	C	1	1	1	1				2				1							
South Manchuria Railway Zone	C																3			
Chosen (See table below)																				
Czechoslovakia (See table below)																				
Egypt																				
Alexandria	C	1	1									1	1			1	3			
Asyut	C	2						1			1									
Beheira	C	61	18	24	9		10	24	1	25	28	20	39		28	50	72	71	70	
Cairo	C	4	1																	
Dakahliya	C	42	14			2	2	3	5		1	6	2		12	26	47	17	36	
Damietta	C	1	1									1								
Gharbiya	C	79	41	10		3	5	12	14	6	25	16	44		64	86	77	78	55	
Girga	C																1	2		
Minufiya	C	36	6	12	2	3				5	6	5	10		8	17	35	56	58	
Qena	C		9	3		3	2	1	2											
Provinces	C	226	107	52	14	29	20	45	27	38	62	49	102	110	116	180	238	226	219	
Greece (See table below)																				
Guatemala (See table below)																				
Hungary	C			5	10														0	1

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases, D, deaths, P, present]

Place		July 30–Aug 26, 1933	Aug 27–Sept. 30, 1933	Oct 1–28, 1933	Week ended— November 1933				December 1933					January 1934				February 1934		
					4	11	18	25	2	9	16	23	30	6	13	20	27	3	10	17
Iraq:																				
Amara	C		1	4																
Baghdad	C	1																		
Ireland, Northern: Londonderry	C												1							
Irish Free State:																				
Kerry County—Dingle	C			4	4															
Roscommon County—Castlerea	C											3								
Waterford County—Lismore	C	1																		
Japan:																				
Aomori Prefecture	C													3		10				
Kobe	C			1																
Osaka	C						1													
Latvia. (See table below.)																				
Lithuania	C	11							12	3	9		9	3	9	12	20	21	14	15
Mexico (See also table below):																				
Mexico, D F	C	1	16	14	14	15	10	7	6	8	13	19								
San Luis Potosi	D		1	1											1					
Torreon	C	1	2			1		2												
Morocco (see also table below)	C	12	2	2						2			5	1	2	1		1	9	
Palestine	C	3	3	4	4							2								
Persia	C	15	24	20	5	5	1						3		4	11		4	12	19
Teheran	C															6	6	2	2	5
Peru. (See table below)																				
Poland	C	66	51	66	34	41	21	24	51	47	64	93	79	97	99	150	169	161	161	155
	D	6	1	5	3		2	5	4	4	4	4	3	6	6	13	9	4	15	11
Rumania (See table below)																				
Spain: Madrid	C		2	1																
Syria	C	2									15									
Trans-Jordan	C																		2	1
Tunisia																				
Tunis	C		1	2											1	1				
Provinces	C																	29		28
Turkey (See table below)																				
Union of South Africa. (See table below)																				
Yugoslavia (See table below)																				

[1] Incomplete reports from San Pedro, Chile, for the month of November 1933 show 113 cases of typhus fever.

Place		August 1933	September 1933	October 1933	November 1933	December 1933	January 1934	Place		August 1933	September 1933	October 1933	November 1933	December 1933	January 1934
Basutoland	C	279	259		366			Peru	C	60	84	55	341	137	
Bolivia	C	34	99	129	39	88		Rumania	C	22	13	28	35	180	269
Chosen	C			3	8	4		Turkey	C	7	9	20	23	27	32
Czechoslovakia	C	1		1	12	14		Union of South Africa							
Greece	C	4	4	3	5	3		Cape Province	C	135	141	166		98	
Guatemala	C	4	5		6	5	29	Natal	C	18	43	42			
Latvia	C	1						Orange Free State	C	140	180	183		241	
Mexico (see also table above)	C	19	42			75	94	Transvaal	C	3	103	24		8	
Morocco (see also table above)	C	14	2	2	1	8		Yugoslavia	C	33	5	38	13	66	298

YELLOW FEVER

Place		June 25–July 29, 1933	July 30–Aug. 26, 1933	Aug. 27–Sept. 30, 1933	Week ended— October 1933: 7	Oct. 14	Oct. 21	Oct. 28	November 1933: 4	Nov. 11	Nov. 18	Nov. 25	December 1933: 2	Dec. 9	Dec. 16	Dec. 23	Dec. 30	January 1934: 6	Jan. 13	Jan. 20
Brazil																				
Ceara State, St. Mathew	C		1																	
	D		1																	
Pernambuco State																				
Granito	C	2																		
	D	2																		
Novo Exu [1]	C	1																		
	D	1																		
French West Africa																				
Guinea	C			[2] 1											2			2		
Niger Territory	C		2	3	1			1												
	D		2	2	[3] 2			1												
Gold Coast																				
Dunkwa	C																		1	
	D																		1	
Keta	C																	1		
N'Kaw Kaw	C												1							
Togoland	C			[2] 1		[2] 1				1										
	D			[2] 1						1										

See footnotes at end of table.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER—Continued

[C indicates cases, D, deaths, P, present]

Place		June 25–July 29, 1933	July 30–Aug 26, 1933	Aug 27–Sept 30, 1933	Week ended— October 1933				November 1933				December 1933					January 1934		
					7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20
Ivory Coast Abengourou	C															1				
	D															1				
Nigeria Kano	C								1											
	D								1											
Senegal:																				
Bakel	C			2		1														
	D			2		1														
Birkelane	C												2							
	D												1							
Dakar	C										1									
	D										1									
Kaffrine	C					1													1	
	D					1													1	
Kaolak	C												1							[4] 1
	D												1							[4] 1
St Louis	D	[4] 1																		
Sebikotane	C										1			1						
	D										1			1						

[1] 2 cases of yellow fever with 2 deaths were reported in Novo Exu, Pernambuco State, Brazil, during the month of June 1933
[2] Suspected
[3] Includes 1 suspected death.
[4] Imported

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 14

APRIL 6 - - - - 1934

IN THIS ISSUE

Incidence and Control of Psittacosis in the United States
Some Experiments with Alum-Precipitated Pollen Extracts
Deaths in Large Cities During the Week Ended March 17
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease, (3) other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

Page

Psittacosis in the United States—Incidence, scientific aspects, and administrative control measures ... 451
Effect of alum-precipitated ragweed pollen extracts on guinea pigs ... 462
Court decisions on public health ... 464
Deaths during week ended March 17, 1934:
Deaths and death rates for a group of large cities in the United States ... 465
Death claims reported by insurance companies ... 465

PREVALENCE OF DISEASE

United States:
Current weekly State reports
Reports for weeks ended March 24, 1934, and March 25, 1933 ... 466
Summary of monthly reports from States ... 468
Weekly reports from cities:
City reports for week ended March 17, 1934 ... 470
Foreign and insular
Canada—
Provinces—Communicable diseases—2 weeks ended March 10, 1934 ... 473
Quebec Province—Communicable diseases—2 weeks ended March 10, 1934 ... 473
Cuba—Provinces—Notifiable diseases—4 weeks ended November 25, 1933 ... 474
Cholera, plague, smallpox, typhus fever, and yellow fever—
Cholera ... 474

PUBLIC HEALTH REPORTS

VOL. 49 APRIL 6, 1934 NO. 14

PSITTACOSIS IN THE UNITED STATES

Incidence, Scientific Aspects, and Administrative Control Measures [1]

By V M Hoge, *Passed Assistant Surgeon, United States Public Health Service*

I. CASES REPORTED IN 1933 AND 1934

Since the last meeting of the Permanent Committee of the International Office of Public Hygiene, we have seen a steady decrease in the number of human cases of psittacosis in the United States. Whereas during the year 1932 there were reported 76 cases with 7 deaths in this country, only 15 cases with 4 deaths were reported during the year 1933 and 2 cases with 1 death in 1934 up to March 1.[2] Of the 76 cases reported in 1932, 41, or 53 9 percent, occurred in California. Of the 15 cases reported in 1933, 10, or 66.6 percent, occurred in California. All reported human cases occurring in the United States were traceable to California-bred birds. It can be said to the credit of the California health authorities, however, that all cases occurring outside the State of California during 1933 appear to have been contracted from birds that were shipped from California in violation of the regulations of the State Department of Public Health.

As a result of the occurrence of human cases in Minnesota and Connecticut in 1933, due to the illegal shipment of birds out of California, those States declared an absolute embargo against the importation of parrakeets. Oregon and the Territory of Hawaii had previously made similar regulations. On March 1, 1934, the State of Maine also declared an embargo against the importation of shell parrakeets.

Following the establishment of a Federal interstate quarantine in September 1932 against the unrestricted shipment of psittacine birds, together with the quarantine and isolation of all psittacine birds in California, the occurrence of human cases abruptly ceased for a time. It was hoped that the measures taken to prevent the spread of the disease had been successful From October 1932 to February 1933 no cases of human psittacosis were reported anywhere in the United States. Suddenly, however, in the late winter and early spring of

[1] Report prepared for presentation to the Permanent Committee of the International Office of Public Hygiene at the meeting in Paris in May 1934

[2] Editorial Note.—Since this article was written, an outbreak of psittacosis has been reported in Pittsburgh, Pa The actual number of cases is not known, but investigation has revealed that 25 cases (including suspected cases) and 10 deaths occurred between Feb 14 and Mar 16, 1934 The outbreak originated in a store where birds were sold

1933, 5 cases occurred in Los Angeles County in rapid succession and from entirely unrelated sources Of these 5 cases, 4 proved fatal. Two officers of the United States Public Health Service had the privilege of seeing 3 of the 4 fatal cases before death and all 4 at autopsy. The epidemiological, clinical, and pathological data for each of these 4 cases are summarized in the following:

The first case in this series was J. Mc., male, age 59, a stonemason, living in Los Angeles. He had one parrakeet which had been in his possession for about 3 years On February 18 his landlady captured a stray parrakeet in her back yard and placed it in the cage with the old bird. Ten days later the recently acquired bird died and was destroyed. Fifteen days after the new bird had been acquired the older bird died and was shown (by the Hooper Foundation laboratory in San Francisco) to be infected with psittacosis.

On February 24, 6 days after the stray parrakeet was captured, the patient suddenly became very ill and rapidly grew worse He was removed to the Los Angeles County Hospital on February 27, at which time his temperature was 103.4° F, pulse 98, respiration 22. These figures did not vary greatly until shortly before death, when pulse and respiration became more rapid and the temperature lower.

On admission a diagnosis of pneumonia was made, but repeated examinations of the chest failed to show any appreciable decrease in resonance. Râles could be heard over the right base posteriorly and the X-ray showed considerable pulmonary infiltration which, as the disease progressed, spread over the entire right lung and part of the left. When seen by us, the patient was for the most part rational but extremely dull and apathetic, making conversation difficult. Contrary to the general rule, this patient began to expectorate thick, tenacious sputum very early in the course of the disease. The virus of psittacosis was recovered from this sputum both by the Hooper Foundation laboratory in San Francisco and the United States Public Health Service laboratory in Pasadena, Calif. The patient died 27 days after the onset of illness.

At autopsy both lungs were found to be involved throughout by what appeared grossly to be a diffuse confluent bronchopneumonia, beginning in the hilar regions and extending out fan-like toward the periphery but not involving the pleura. Examination both macroscopically and microscopically showed the density to be much less than in that of ordinary pneumonia, thus accounting for the resonant percussion note during life.

White mice were inoculated with emulsions of fresh lung tissues but the virus was not recovered from this source. Histological examination of the lung, however, easily revealed the "elementary bodies" or "L.C.L." bodies of psittacosis.

Aside from its clinical features this case clearly shows the incubation period in the man to have been 6 days and in the bird 15 days. It also shows that old healthy birds may be susceptible to psittacosis, though we know young birds to be more so The ultimate source of the infection could not be traced, but it is interesting to note that about this time many aviary owners whose birds were in quarantine were releasing them rather than have them destroyed. This practice was condemned by the local health authorities as being a public-health menace, and it seems that in this case at least their fears were well founded.

The second case was that of M. P , male, age 41, a blacksmith and wrestler by trade This case differed from the average from the standpoint of age and excellent physical development of patient, mode of infection, and rapid fatal termination.

This man had a small aviary of about 20 parrakeets which he had started 3 years before and had added no new stock. About March 10, he bought a parrot from a local dealer, which is said to have bitten him on the finger soon after bringing it home. The man became ill on March 19, 8 days after being bitten, having a sudden onset of fever, chills, headache, and great prostration The illness was diagnosed as pneumonia; but the case was not hospitalized, and clinical records were not available. The patient grew rapidly worse and died 7 days after onset of the disease. Shortly before death a specimen of sputum was obtained, from which the virus of psittacosis was recovered. Both the parrot which was said to have bitten the patient and 9 of the 20 parrakeets were shown by laboratory examination to be infected with psittacosis.

At autopsy no evidence of a bite wound could be found. Both lungs showed massive consolidation of denser consistency than is usually seen in psittacosis. As the body had been embalmed, we were unable to perform animal inoculation tests with the fresh lung tissue, but "L.C.L." bodies were readily demonstrated in the lung on histological examination

This case aptly illustrates two important factors. One is the speed with which psittacosis can spread through a flock of psittacine birds, and the other is the great increase in virulence when the virus is introduced directly into the blood stream by the bite of an infected bird. This man, who was comparatively young and in the finest of physical condition, would ordinarily be conceded an excellent chance of recovery; but he succumbed in less than half the usual time required in cases where the infection is contracted through the respiratory tract.

The third case was W. F., male, age 73. This man raised parrakeets on his small ranch. He usually kept about 125 to 150 birds; and,

as he attended them himself, it could not be learned whether or not he had recently acquired any new stock. It was learned, however, that a few weeks before taking sick he had found a parrakeet outside the cage and had placed it in with the others. After this patient had been taken sick, his daughter began taking care of the birds, and it was noticed that occasionally a bird would die The owners supposed this to be due to irregular feeding. However, as the man appeared to be ill with psittacosis, his aviary was visited by officials of the United States Public Health Service on March 31, 1933, and a parrakeet which had died on the previous day was secured and brought to the laboratory for examination. At autopsy this bird was grossly suspicious for psittacosis, having an enlarged liver with many areas of necrosis. The spleen was also enlarged to a diameter of 6 millimeters. A portion of the spleen and liver inoculated into white mice produced the typical lesions of psittacosis, and the liver of the bird on histological examination showed numerous virus bodies

This patient was taken to the hospital on March 24, 1933, 3 days after the onset of his illness, and was extremely ill from the beginning. The characteristic disproportion between pulse and temperature rate was well illustrated. At time of admission to the hospital, the temperature was 102 6° F , rising to 104° F. the following day and remaining between that and 105° F. for the first 2 weeks of his illness. The pulse rate, however, on admission was only 60 and remained between 60 and 70 until the latter part of the second week of his illness, when it slowly rose to 120 and remained at that figure until death. When seen by us early in the second week of his illness the patient was comatose and had Cheyne-Stokes breathing It appeared that death was but a few hours distant but the fact that he lived for nearly 2 weeks longer served again to emphasize the fact that it is impossible to make an accurate prognosis in this disease.

The illness of this patient was attended with considerable coughing throughout, with the production of a great deal of extremely tenacious sputum. We were unable to demonstrate the virus of psittacosis in the first specimen obtained, but were able to do so easily in the second specimen. It has frequently been demonstrated that virus may be present in one specimen and absent in another, although the physical nature of the two specimens may appear the same. This emphasizes the necessity of taking repeated specimens of sputum in all suspected cases.

Death occurred on April 13, 23 days from onset. At autopsy both lungs showed extensive involvement radiating out from the hilar region but not involving the pleura. The involved areas did not show the consistency of hepatization, but were of a rubbery nature, and a frothy purulent material could be expressed. An emulsion of the

fresh lung tissue readily produced the lesions of psittacosis in white mice. Sections of the lung examined histologically showed numerous "L.C L" bodies After death of this patient, all birds in his aviary were sacrificed by the owners and examination of these birds at the Hooper Foundation laboratory demonstrated that about 25 percent showed macroscopic evidence of psittacosis. Hence, in this case we have an unusually complete picture, in that virus of psittacosis was demonstrated, first, in the parrakeet, both by animal inoculation and direct histological examination; second, in the patient's sputum; third, in animal inoculation of fresh lung tissue emulsion, and fourth, by histological examination of the human lung and spleen.

The fourth and last fatal case in this series occurred in Pomona, Calif. (about 50 miles from Los Angeles), in May 1933

A C., a female, age 53 years, had been living with a family who had had one parrakeet for several months. A young male parrakeet was obtained to mate with the old female; and about 2 weeks after the young parrakeet had been acquired, the woman was taken sick. As psittacosis was suspected, both birds were turned over to the United States Public Health Service laboratory for examination. Autopsy showed that the older bird was healthy, but that the young bird was infected with psittacosis

On admission to hospital, shortly after the onset, the patient complained of severe headache, chills, and pains in the back. There were also several nervous manifestations, consisting of parasthesia in the fingers and toes, and a nonproductive cough, described by the patient as a "nervous cough." She further stated, that she had a "fluttering sensation in her abdomen." Patient's temperature on admission was 103° F., and ranged between that and 104° F. until just before death, when it fell to normal. The pulse rate maintained a characteristic low level, ranging from 70 to 100 throughout, with the consistently relatively slow respiration rate of 20 per minute.

When seen by us on the seventh day after admission to the hospital, the patient was obviously extremely ill but conscious and rational. While apparently the outcome was likely to be fatal, her condition at that time, based on our previous experience, did not indicate that death would intervene for several days. However, the patient died within a few hours after having been seen by us.

At autopsy the lungs were strikingly similar to those observed in the three preceding cases. The color was a grayish-purple, and consolidation was found to be extensive in both lungs. On gross examination it was seen that the consolidation was central in type and did not extend to the pleura, there being a layer of crepitant tissue surrounding each consolidated area. On cut section, the consolidated area was grayish-red in color and exuded a mucopurulent material on slight pressure. It was further observed that

the consolidated areas did not show the firm consistency of ordinary pneumonia, but that sections cut from consolidated areas floated on water.

The virus of psittacosis was obtained by inoculation of emulsions of both lung and spleen tissues into white mice. "L.C.L." bodies were also demonstrated in the lung by direct histological examination

This case again emphasizes the considerable danger involved in acquiring immature parrakeets, especially from untested sources, and further demonstrates that the prognosis in human cases of psittacosis must be made with extreme caution.

II. SCIENTIFIC ASPECTS

Concerning the scientific developments in the studies on psittacosis, it must be admitted that fundamentally the disease remains almost as much of a mystery as it was at the time of our last meeting That it is caused by a filterable virus has of course been established since 1930. That the nature of the virus still remains a mystery is admitted by all investigators. The nature of the "L.C.L." bodies observed in both animal and human tissue infected with psittacosis is likewise unknown. Are they the virus or are they reactionary products? Are they bacterial or protozoan in nature? That they are the virus itself perhaps seems the more probable. Bedson has suggested that the virus goes through a fairly rapid developmental cycle at some stage of which it is virulent and at others avirulent or nearly so Several observations of our own seem to indicate that this may be true. We have seen that it is difficult, if not impossible, at times to recover virus by filtration from material known to contain the virus. It is also obvious that the visible objects which we consider virus bodies are too large to pass through the pores of a Berkefeld N candle. For this reason it seems that at some time the virus must assume an ultra-microscopic form. That the virus in infected birds is extremely virulent over relatively short spaces of time has been seen on several occasions, when persons having contact with sick birds over a long period of time and others having only momentary exposure become sick almost simultaneously.

The technique of diagnosis of this disease has improved little if any since Krumweide, Rivers, and Berry, and other workers, demonstrated that white mice were susceptible to the disease and made excellent diagnostic animals. This procedure has been used exclusively by us and, except for the time required, has been entirely satisfactory and reliable. We have found sputum to be the only ante mortem material of value in making inoculation tests. If repeated specimens are taken, we rarely fail to demonstrate the virus if the case is psittacosis. We have found the patient's blood to be of little or no

value as inoculating material for diagnostic tests and have discontinued its use for this purpose. While formerly we considered a histologic examination of both bird and mouse tissue necessary before a diagnosis of psittacosis could be made, we now use this procedure largely as a confirmatory step. We have found that the relative ease with which "L.C L." bodies can be demonstrated in fresh impression smears of the mouse spleen, using a modification of Castaneda's stain, together with the characteristic appearance of the liver, makes practical diagnosis possible within a few minutes after the mouse is autopsied In this way the diagnosis of a human case can usually be confirmed in 5 to 10 days However, negative results do not necessarily prove that the case is not psittacosis

Rapid diagnosis can frequently be made in the suspected birds by direct examination It has been found that, in general, parrakeets having spleens less than 4 millimeters in diameter are unlikely to be infected with psittacosis, and those having spleens over 4 millimeters are likely to be infected This is by no means a hard and fast rule, however, and is used only as a convenience in assorting spleens for animal inoculation. Spleens under 4 millimeters may contain the virus and spleens may be enlarged to more than 4 millimeters by some other disease. Fresh impression smears of the bird spleen stained with a modification of Castaneda's stain frequently show the presence of "L.C.L." bodies and establish an immediate diagnosis. The failure to demonstrate "L.C L." bodies in the bird spleen cannot be considered as an indication that psittacosis is not present, however, and animal inoculation must be made in all cases.

It is believed that a correct bedside diagnosis is more frequently arrived at than was the case 2 years ago There is no doubt that a great many cases of psittacosis were missed in the first few years after the disease became known in the United States. Extensive publicity by the lay press, together with considerable information given out through medical literature, has brought the disease to the attention of practically every physician and health officer in the country. It is now probable that instead of cases being missed, some are erroneously diagnosed psittacosis. Whether or not that be true, the number of reported cases has steadily and materially decreased.

There have been no new developments in the treatment of psittacosis. It has not been possible to demonstrate protective antibodies for psittacosis virus in human convalescents, or in artifically immunized animals. For this reason the routine use of human convalescent serum has for the most part been discontinued. This would seem to discredit the popular belief that one attack of psittacosis conveys permanent immunity to the individual. However, we have no knowledge of a second attack of psittacosis occurring in human beings.

With our limited knowledge of psittacosis, our most effective weapon in dealing with the disease is in control of the birds themselves. A recent important observation in this respect is that young birds are more susceptible to psittacosis and, therefore, a more potent source of danger With this fact established, we have required that all psittacine birds be at least 8 months of age before being shipped in interstate commerce It is believed that this regulation alone has been of vital importance in reducing the incidence of the disease.

III. ADMINISTRATION OF PSITTACOSIS CONTROL

At the time of the meeting in April and May 1932, the United States Government had already instituted measures to prevent the importation of psittacosis. At the time of the 1929–30 epidemic, it appeared that most human cases had been contracted from parrots and that these birds were the principal vectors. Consequently, the first control measure instituted by the United States was the placing of an embargo, by Executive order, on the importation of parrots. This embargo was made effective January 24, 1930, and was absolute except under certain conditions prescribed by the Secretary of the Treasury, which allowed the importation of parrots only after 15 days' quarantine detention and careful inspection by an official of the United States Biological Survey to determine the freedom of the birds from psittacosis.

By 1932 it had been determined that parrots were not the only vectors of psittacosis, or indeed the most important, that role having been assumed by the shell parrakeet (*Melopsittacus undulatus*), apparently due to its greater frequency in commerce, and that all, or nearly all, psittacine birds were actual or potential vectors of psittacosis. Consequently, on October 6, 1932, the original Executive order of January 24, 1930, which had placed limitations on the importation of parrots only, was further amended and extended to include all the psittacidae, naming specifically all birds commonly known as parrots, Amazons, Mexican double heads, African grays, cockatoos, macaws, lories, parrakeets, love birds, and all similar birds. At the same time it was provided further that the importation of all psittacine birds should be in accordance with strict sanitary measures, which were essentially those recommended in the report of the Commission on Psittacosis and approved by the Permanent Committee of the Office International d'Hygiène Publique at its meeting of May 4, 1932.

The amendment to the Federal Quarantine Regulations of October 6, 1932, further provided that the ports of entry for importation of psittacine birds into the United States shall be limited to such ports only as have quarantine detention facilities, and that each shipment

shall be detained at such stations under observation for a period of 15 days. If any death or serious illness occurs in the birds during the 15-day period they are not released, and the detention period is extended over another period of 15 days from the date of last illness or death. If psittacosis is discovered in any shipment of psittacidae, as proved by laboratory examination, the shipment is disposed of in such manner as the Surgeon General of the Public Health Service may deem necessary. In practice, such shipments usually are deported or destroyed.

It has been established that both in naturally and artificially infected birds, the incubation period may be many weeks and that the disease may remain latent for a very extended period of time. For this reason it might appear that the 15-day detention period would be inadequate, and this view has been held by some investigators. Practically, however, the results seem to have been satisfactory, as no human cases of psittacosis are known to have occurred from contact with recently imported birds since October 1932. Since psittacine birds are extremely sensitive to changes of location and climate, any incipient disease is almost certain to become apparent during the 15-day detention period, and thus automatically increases the length of time in which the birds are held under observation.

During the years 1931 and 1932, sporadic cases of psittacosis due to exposure to infected parrakeets occurred in a great many different States. Investigation pointed to California as the origin of the birds in nearly every case. The California State health officials, believing that psittacosis was being introduced into the State from outside sources, adopted a resolution on February 13, 1932, prohibiting the importation, into the State of California, of all birds of the psittacine family for a period not to exceed 6 months. As human cases continued to occur after the State embargo became effective, further study of the problem became necessary.

Early in 1932 the California State Department of Health, with the assistance of the United States Public Health Service, began an extensive epidemiological study of the psittacosis problem. It soon became apparent that parrakeet breeding was an industry of major proportions in California. Eleven hundred and forty aviaries with upward of 100,000 parrakeets were inspected and registered. Seventy-six and nine tenths percent of these were located in seven southern California counties, 54.9 percent being in Los Angeles County alone. The remaining 23.1 percent was distributed over 30 northern counties. The great majority of these aviaries was of the small "back-yard" variety and, hence, not readily amenable to regulation.

During 1932, in the course of investigations of several human cases, it was determined by laboratory tests that psittacosis had become endemic in California aviaries. Further laboratory tests revealed that the number of infected aviaries was surprisingly high, being

reported by Dr. K. F. Meyer of the Hooper Foundation laboratory, where most of the tests were performed, as being close to 60 percent.

Attempts by the California State Department of Public Health to limit the spread of the disease by regulation of breeding and marketing activities were met by such a storm of protest from the aviary owners as seriously to handicap their efforts. Since cooperation of some of the parrakeet breeders and dealers could not be obtained, and human cases of psittacosis traceable to California-bred birds continued to occur in widely separated areas of the United States, it became necessary for the United States Government to impose limitations on the interstate shipment of these birds Consequently, on September 28, 1932, a provision was added to the Interstate Quarantine Regulations prohibiting the interstate transportation by common carrier of any bird or birds of the parrot family unless such shipments were accompanied by a certificate of the State health authorities stating that such birds were, to the best of their knowledge and belief, from sources free from psittacosis As it was difficult to determine that aviaries were free from psittacosis, certificates of health were not freely given and the interstate shipment of parrakeets almost ceased. That these measures were of considerable protective value is seen in the greatly reduced number of cases occurring outside the State of California.

Diligent efforts to control the spread of psittacosis within the State have been made by the California authorities since early in 1932. In March of that year, all aviaries found to contain infected birds were placed in quarantine for an indefinite period. Those found to be free from psittacosis were permitted to sell their birds. In addition, all persons or firms engaged in the breeding or commerce in psittacine birds were required to register with the State Department of Public Health. Definite instructions were given as to the keeping of records of all transactions in such birds, as well as a record of all cases of sickness and death. Regulations further gave instructions in the sanitary housing, care, and shipment of such birds. Itinerant bird vendors, who had previously been responsible for several human cases of psittacosis, were required to obtain a permit from the health officials before offering any psittacine birds for sale.

While known infected psittacine birds had been under quarantine since March, it was felt that psittacosis was still being disseminated from unquarantined sources; and so, on October 6, 1932, in addition to the quarantine of infected birds, all psittacine birds in the State of California were placed in isolation on the premises where located and not moved therefrom except by written permission of the local health officers. This regulation was modified in December 1932 to permit local health officers to issue certificates of health for the interstate shipment of all psittacine birds other than parrakeets, provided such birds had not been in contact with parrakeets for a period of 90 days.

By the first of the year 1933, much of the confusion and uncertainty that had attended the earlier attempts to regulate the bird-breeding industry in California had been overcome and a practical working procedure decided upon. Breeders were required to maintain at least 3 pens separated by a distance of at least 5 feet. The first pen was maintained for breeding purposes only; the second pen for maturing the birds to the age of 7 months. At the age of 7 months the birds were given a leg band on which was stamped the registration number and code number of the owner, and placed in the third or isolation pen for a period of 30 days At the end of the 30-day period, the birds were inspected by a health officer and a certificate of health given for their release At the same time the owner was required to sign an agreement to the effect that if any case or cases of human psittacosis were traced to his aviary, and laboratory examination of 10 percent of his birds proved the presence of psittacosis, such aviary was to be destroyed and his certificate of registration revoked.

That these measures to prevent the spread of psittacosis were attended with considerable success is seen in the greatly reduced incidence of the disease during the year 1933 On several occasions, however, certificates were fraudulently altered and young and sickly birds were shipped out of the State, resulting in human cases of psittacosis. It then became apparent that more stringent methods of control would have to be instituted, and on December 20, 1933, the United States Interstate Quarantine Regulations were amended to require that no birds of the psittacine family could be shipped in interstate commerce unless such birds be at least 8 months old and be accompanied by a certificate of health signed by the State health officer stating that to the best of his knowledge and belief they are from a source free from psittacosis, such certificates to be granted after the usual inspection supplemented by such laboratory tests as the certifying authority may deem necessary. In the future it is intended that certificates shall be granted only to birds from laboratory-tested aviaries, and that aviaries found to be infected shall be voluntarily destroyed or placed in permanent quarantine.

In February 1934 an improved type of health certificate was adopted by the California State Department of Public Health, which describes in detail the shipment for which issued. This certificate is executed in quadruplicate and sworn to by the shipper. One copy is sent to the central State health office, 1 to the health officer at point of destination, 1 becomes the property of the common carrier, and 1 is retained by the issuing office. This improved certificate not only prevents the shipment of unauthorized birds but serves to advise the health officer at point of destination of the arrival of such birds. Having thus been informed of the arriving shipment, all local health officers may refuse its admission to their jurisdiction if deemed advisable.

In conclusion, it must be said that although efforts to suppress the spread of psittacosis in the United States have met with constant opposition and have been attended with many technical difficulties, the results obtained have been quite gratifying. Whether the decreased incidence of the disease has been entirely due to international efforts at control, or whether some other factor is involved, it is impossible to say. In any case, the fight is not over. We know little more of the intrinsic nature of the disease now than was known 2 years ago.

To what extent the disease may spread under favorable conditions is likewise unknown. Certainly few diseases can claim a more diversified list of susceptible species. It has been proved that a considerable number of the smaller nonpsittacine species of birds are susceptible. We have recently demonstrated that chickens are readily susceptible experimentally both by inoculation and by feeding of infected material. That the disease might become an economic as well as a public-health problem seems entirely possible.

EFFECT OF ALUM-PRECIPITATED RAGWEED POLLEN EXTRACT ON GUINEA PIGS

By W. T. Harrison, *Surgeon, United States Public Health Service*

It has been shown that guinea pigs may be readily sensitized by the injection of extracts prepared from various plant pollens. These animals react in the usual manner, presenting characteristic symptoms of anaphylactic shock when later injected intravenously with extracts of the pollen to which they have been sensitized. Sublethal doses will bring about desensitization so that the animal will, for the usual period, fail to react to the full shocking dose.

The precipitation of crude toxoid by the addition of potassium alum yields a product which is a much more effective immunizing agent, both in man and in animals, than the crude toxoid from which the precipitate was obtained. This increased efficiency has been generally attributed to the very slow absorption of precipitated toxoid with resulting continued stimulation of the immunity mechanism over a comparatively long period, since induration at the site of injection may be detected for as long as 6 to 8 weeks.

An attempt has been made to apply this principle to ragweed pollen extracts in the hope that slow absorption of the precipitated extract would permit the injection of larger amounts in fewer doses and at greater intervals. Precipitated extracts have been prepared and attempts have been made to desensitize guinea pigs previously sensitized by injection with an aqueous extract of giant ragweed pollen.

The aqueous extracts were prepared by extracting the dry pollen for 7 days with a solution containing 2.5 grams of sodium chloride, 2.7 grams of sodium bicarbonate, and 5 cc of phenol per liter, and then filtering To prepare the precipitate, potassium aluminum sulphate 1.1 percent was added to the aqueous extract and the golden-yellow precipitate washed with the extractive fluid and made up to original volume. The precipitate tended to settle out on standing, but the supernatant liquid remained clear and colorless.

Guinea pigs were sensitized by injecting intraperitoneally 1 cc of a 2-percent aqueous extract After 4 weeks, 3 of these pigs received subcutaneously 1 cc of precipitated extract and 3 were reserved as controls After an additional 10 days all animals were injected intravenously with 2 cc of a 4-percent aqueous extract The 3 control pigs showed slight to moderate symptoms, rubbing of nose, coughing, roughing of hair of back and neck, followed by prompt recovery, while of the 3 pigs which received a "desensitizing" dose of 1 cc precipitated extract all showed immediate severe symptoms, 1 died from typical anaphylaxis, the others recovered slowly. In these pigs the indurated nodule at the site of the injection of the precipitated extract 10 days previous to the shocking dose was still very noticeable, showing that all of the injected material had not been absorbed

A 1-percent aqueous extract was prepared in the usual way, and one half was precipitated by the addition of alum and made up to original volume A series of guinea pigs was injected subcutaneously with 1 cc, half of them receiving the aqueous extract and half the precipitated extract After 6 weeks, 5 of each group were injected intravenously with 1 cc of a 2-percent aqueous extract. Of the pigs sensitized with the aqueous extract, 3 showed no symptoms and 2 showed mild symptoms. Of those sensitized with the alum-precipitated extract, 3 showed severe symptoms, 1 dying in 3 minutes of typical anaphylaxis, and 2 showed moderate symptoms. These pigs were sick after the reaction had subsided, recovered slowly, and could be separated readily by a disinterested observer from those sensitized with the aqueous extract.

An effort was next made to determine the amount of potassium alum that could be added to an aqueous pollen extract without interfering with its desensitizing action. Since earlier experiences had shown that alum-precipitated extract is a much better sensitizing agent than aqueous extract of the same strength, a series of pigs was sensitized by subcutaneous injection with 1 cc of a 1-percent alum-precipitated extract. Alum (0.1, 0.2, 0.3, 0.4, 0.6, and 0.8 percent) was added to a 2-percent aqueous extract, and 1 cc of each alum dilution was injected subcutaneously in each of two pigs of the sensitized series 25 days after the sensitizing dose. After an additional 5 days all pigs received intravenously a shocking dose of 1 cc of a 2-percent

aqueous extract. Pigs receiving 0.1, 0.2, and 0.3 percent of alum extract were completely desensitized, and one of the pigs receiving 0 4-percent alum extract showed slight symptoms, but those receiving 0.6-percent and 0 8-percent alum extracts were very sensitive, showing immediate severe symptoms Two pigs which had received only the original sensitizing dose of precipitated extract showed severe symptoms following the shocking dose.

The desensitizing value of these alum extracts seemed to be in inverse proportion to the amount of alum added and the amount of induration following the desensitizing dose. Six tenths and 0.8 percent alum caused an indurated nodule which was still present 5 days after injection.

CONCLUSIONS

1 Alum-precipitated ragweed pollen extract is a very effective sensitizing agent in guinea pigs This solid form is much more effective than the same amount of extract in aqueous solution. Guinea pigs with the precipitated extract in the abdominal wall for 10 days were still very sensitive to a shocking dose given intravenously.

2 It is probable that the slow absorption of precipitated pollen extract more closely approaches the natural method by which humans become sensitive to plant pollens.

3. Addition of alum, in concentration as high as 0 3 percent, to ragweed pollen extract does not interfere with its desensitizing properties. It is possible that this small amount might slow absorption sufficiently to permit injection of larger doses in hypersensitive persons.

COURT DECISIONS ON PUBLIC HEALTH

City held liable for damages resulting from operation of sewage disposal plant.—(Texas Court of Civil Appeals; *City of Tyler* v *House et ux.*, 64 S.W.(2d) 1007; decided Oct. 26, 1933) An action was brought against a city for damages alleged to have resulted from the operation of the city's sewage disposal plant. The jury's findings established that the plaintiffs, who owned a farm in the vicinity of the disposal plant, had been caused material discomfort and annoyance in the occupation and enjoyment of their home and premises and that the rental value of their farm had been materially reduced. The trial court rendered judgment for the plaintiffs upon the jury's verdict, and the city appealed.

Some of the points decided by the court of civil appeals were as follows: (*a*) It could be safely stated as the law in Texas that a city was liable in damages to neighboring property owners when it constructed and operated on its premises a sewage disposal plant which polluted the air and produced such discomfort and annoyance as to

impair the comfortable enjoyment of such neighboring property by persons of ordinary sensibilities, and that this was true irrespective of any question of negligence on the part of the city in the construction and operation of its plant, (b) likewise, a city would be held liable when it permitted the filth and waste from its sewage plant to escape into a stream and be thereby carried and spread upon the lands of another to his injury, and (c) a temporary injury to land was measured by the reduced rental value of the property since the time complained of

The trial court's judgment was affirmed

Compensation granted under workmen's compensation act for death from tularaemia —(Georgia Court of Appeals, Division No 1; *Great Atlantic & Pacific Tea Co* v. *Wilson*, *Wilson* v *Great Atlantic & Pacific Tea Co* , 171 S E 827, decided Nov 11, 1933) A claim under the workmen's compensation act was brought by a widow for the death of her husband from tularaemia The deceased had been employed as the manager of the meat department in a retail store An award in favor of the claimant was made by the director of the department of industrial relations and was affirmed by the superior court On appeal to the court of appeals the action taken below was affirmed, the appellate court summing the matter up as follows

In conclusion, we are of the opinion, after reading many authorities and after a careful scrutiny of the evidence, that the commissioner [director] was authorized to find that the deceased was injured by cutting his hand while in the course of his employment, that the disease of tularaemia was contracted from rabbits handled in his place of work, and that such disease was the natural and unavoidable result of the accident and was the contributing cause of his death. * * *

DEATHS DURING WEEK ENDED MAR. 17, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar 17, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	9, 012	8, 676
Deaths per 1,000 population, annual basis	12 6	12 1
Deaths under 1 year of age	625	647
Deaths under 1 year of age per 1,000 estimated live births	58	[1] 55
Deaths per 1,000 population, annual basis, first 11 weeks of year	12.7	12.4
Data from industrial insurance companies		
Policies in force	67, 590, 873	68, 819, 116
Number of death claims	16, 012	13, 721
Death claims per 1,000 policies in force, annual rate	12 4	10.4
Death claims per 1,000 policies, first 11 weeks of year, annual rate	11.1	11.2

[1] Data for 81 cities

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Mar. 24, 1934, and Mar. 25, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar. 24, 1934, and Mar 25, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar 24, 1934	Week ended Mar 25, 1933	Week ended Mar 24, 1934	Week ended Mar 25, 1933	Week ended Mar 24, 1934	Week ended Mar 25, 1933	Week ended Mar 24, 1934	Week ended Mar 25, 1933
New England States:								
Maine	1	1	1	2	54		0	0
New Hampshire				1	255		0	0
Vermont					17	44	0	0
Massachusetts	15	17		5	2,177	375	2	1
Rhode Island	1	2		1	7		0	0
Connecticut	8	6	1	19	26	240	0	1
Middle Atlantic States:								
New York	52	76	[1] 19	[1] 36	1,411	3,903	8	3
New Jersey	30	22	24	9	483	1,716	3	1
Pennsylvania	59	73			2,449	1,176	2	6
East North Central States								
Ohio	25	40	29	10	901	639	3	0
Indiana	15	24	46	90	1,525	112	3	10
Illinois	32	48	46	32	1,908	398	14	29
Michigan	18	18	6	12	141	823	0	3
Wisconsin	10	7	41	64	1,363	390	2	0
West North Central States								
Minnesota	4	27	1	2	287	1,326	2	2
Iowa [2]	11	11	12		291	5	3	0
Missouri	48	30	244	22	881	250	4	1
North Dakota	9	9			113	21	1	4
South Dakota	5	4	5	1	571	3	0	0
Nebraska	5	13	10	2	225	27	1	0
Kansas	7	5	4	3	263	309	3	1
South Atlantic States:								
Delaware	2	1			221	7	0	0
Maryland [2]	8	8	39	24	1,055	12	1	0
District of Columbia	9	3		1	711	5	0	1
Virginia	27	13			1,290	480	6	2
West Virginia	8	14	39	12	92	276	3	0
North Carolina [2]	18	17	47	64	3,384	509	0	0
South Carolina	8	7	586	751	546	171	0	0
Georgia [2]	10	8		319	1,995	64	0	1
Florida	7	5	3	10	243	57	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar 24, 1934, and Mar 25, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar 24, 1934	Week ended Mar 25, 1933	Week ended Mar 24, 1934	Week ended Mar 25, 1933	Week ended Mar 24, 1934	Week ended Mar 25, 1933	Week ended Mar 24, 1934	Week ended Mar 25, 1933
East South Central States								
Kentucky	8	6	49	53	636	130	1	0
Tennessee	13	9	99	105	1, 157	53	2	2
Alabama	14	14	118	121	705	15	1	2
Mississippi [2]	5	5					0	4
West South Central States								
Arkansas	7	9	42	48	681	152	0	3
Louisiana	27	17	18	33	408	31	0	1
Oklahoma [5]	18	9	94	56	563	77	4	2
Texas [3]	109	132	422	147	1, 461	1, 180	6	1
Mountain States								
Montana [4]	2				62	57	0	1
Idaho [4]	1			5	179	32	0	0
Wyoming [4]		4			50	4	0	0
Colorado	3	1		31	299	11	1	0
New Mexico	5	14	3		42	10	1	2
Arizona	1	3	21	1	61	33	0	0
Utah [2]	1	3		3	542	2	0	0
Pacific States								
Washington	4	9	25	3	196	37	1	1
Oregon [4]			54	42	142	64	0	0
California	43	55	45	50	1, 158	1, 378	2	7
Total	713	799	2, 193	2, 190	33, 230	16, 604	80	92

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar 24, 1934	Week ended Mar 25, 1933	Week ended Mar 24, 1934	Week ended Mar 25, 1933	Week ended Mar. 24, 1934	Week ended Mar 25, 1933	Week ended Mar 24, 1934	Week ended Mar 25, 1933
New England States								
Maine	0	0	8	8	0	0	6	1
New Hampshire	1	0	15	25	1	0	0	0
Vermont	0	1	9	26	0	0	1	0
Massachusetts	0	0	302	456	0	0	1	4
Rhode Island	0	0	16	31	0	0	0	0
Connecticut	0	0	81	147	0	0	2	0
Middle Atlantic States								
New York	0	3	947	1, 110	0	0	6	11
New Jersey	0	0	220	354	0	0	4	6
Pennsylvania	0	1	674	1, 069	0	0	6	8
East North Central States								
Ohio	2	0	629	635	1	23	1	3
Indiana	0	0	244	175	1	6	12	2
Illinois	0	1	712	535	6	16	1	2
Michigan	0	0	913	603	3	2	9	5
Wisconsin	0	1	265	154	37	2	0	1
West North Central States								
Minnesota	0	0	84	109	2	0	0	0
Iowa [3]	1	0	84	54	4	42	1	0
Missouri	1	1	123	78	7	21	2	5
North Dakota	0	0	38	15	3	0	0	1
South Dakota	0	0	18	19	0	0	0	1
Nebraska	0	0	38	42	4	3	0	0
Kansas	0	0	92	65	5	1	0	4
South Atlantic States								
Delaware	0	0	11	12	0	0	0	1
Maryland [3]	1	0	92	110	0	0	10	1
District of Columbia	0	0	15	15	0	0	0	0
Virginia	0	0	47	63	0	0	2	5
West Virginia	0	1	87	31	0	1	6	8
North Carolina [3]	0	0	40	51	0	1	1	2
South Carolina	0	0	1	3	2	0	6	5
Georgia [3]	0	0	14	7	1	3	8	3
Florida	0	0	3	7	0	0	6	18

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar 24, 1934, and Mar 25, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar 24, 1934	Week ended Mar 25, 1933	Week ended Mar 24, 1934	Week ended Mar 25, 1933	Week ended Mar 24, 1934	Week ended Mar 25, 1933	Week ended Mar 24, 1934	Week ended Mar 25, 1933
East South Central States								
Kentucky	0	0	33	64	0	0	1	6
Tennessee	0	1	34	41	3	2	2	8
Alabama	0	1	5	13	0	14	3	2
Mississippi [2]	0	0	4	3	2	0	4	10
West South Central States								
Arkansas	0	0	6	8	0	15	3	3
Louisiana	0	0	30	11	1	0	14	7
Oklahoma [5]	0	0	16	15	1	7	2	1
Texas [3]	2	1	73	37	27	8	12	12
Mountain States								
Montana [4]	0	0	11	10	0	0	0	5
Idaho [4]	2	0	1	7	13	6	1	1
Wyoming [4]	0	0	8	8	0	0	0	1
Colorado	0	0	20	11	4	0	0	1
New Mexico	1	1	19	17	0	0	0	1
Arizona	0	0	25	23	0	0	3	0
Utah [2]	0	0	9	6	0	0	0	0
Pacific States								
Washington	1	0	68	61	5	8	2	0
Oregon [4]	0	0	30	29	8	2	2	3
California	7	3	216	176	3	48	7	5
Total	19	16	6,430	6,549	144	231	147	163

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended Mar 24, 1934, 12 cases, as follows North Carolina, 1, Georgia, 5, Texas, 6
[4] Rocky Mountain spotted fever, week ended Mar 24, 1934, 5 cases, as follows Montana, 1, Idaho, 1, Wyoming, 1, Oregon, 2
[5] Exclusive of Oklahoma City and Tulsa

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1934										
Alabama	4	105	856	55	1,903	11	1	96	2	11
Arizona	3	16	122		153	1	1	103	3	4
California	11	170	177	6	6,334	9	24	1,090	14	29
Georgia	5	83	846	51	7,283	21	0	38	0	30
Idaho	1	9			453		2	48	29	3
Illinois	31	136	174	7	2,416		4	2,423	15	16
Iowa	4	32	49		481		2	299	22	5
Louisiana	1	91	54	45	489	6	1	111	12	35
Minnesota	3	96	9		807		1	275	28	6
Montana	2	14	169		78		0	79	0	3
North Carolina	5	103	290		11,164	13	2	213	1	3
Oregon		12	204		250		1	178	18	3
Rhode Island		15			22		0	66	0	0
South Dakota	2	4	43		1,984		1	57	2	1
Tennessee	7	52	598	40	3,254	4	1	203	4	18
Texas	16	589	2,874	788		56	3	607		95
Washington	4	11	70		932		2	245	16	8

February 1934

Disease and State	Cases
Actinomycosis	
Illinois	1
Anthrax	
California	1
Botulism	
Montana	3
Chicken pox	
Alabama	223
Arizona	172
California	2,861
Georgia	227
Idaho	30
Illinois	2,088
Iowa	337
Louisiana	100
Minnesota	676
Montana	127
North Carolina	811
Oregon	205
Rhode Island	184
South Dakota	81
Tennessee	220
Washington	473
Conjunctivitis	
Georgia	3
Dysentery	
Alabama (amoebic)	4
Arizona	3
California (amoebic)	31
California (bacillary)	11
Georgia (amoebic)	1
Georgia (bacillary)	9
Illinois (amoebic)	50
Illinois (bacillary)	4
Illinois (carriers)	232
Louisiana	5
Minnesota (amoebic)	17
Montana (amoebic)	1
South Dakota (amoebic)	1
Tennessee	15
Washington (amoebic)	1
Washington (bacillary)	6
Food poisoning	
California	5
German measles	
Alabama	257
Arizona	261
California	392
Illinois	73
Iowa	637
Montana	6
North Carolina	21
Rhode Island	2
Tennessee	70
Washington	4
Granuloma, coccidioidal	
California	4
Hookworm disease	
California	1
Georgia	384
Louisiana	55
Impetigo contagiosa	
Arizona	10
Illinois	4
Montana	14
Oregon	55
Tennessee	1
Jaundice, epidemic	
California	1
Montana	7
Lead poisoning	
Illinois	3
Leprosy	
California	1
Washington	1
Lethargic encephalitis	
Alabama	5
California	4
Georgia	1
Illinois	4
Iowa	4
Louisiana	2
Minnesota	1
Oregon	1
Tennessee	1
Washington	3
Milk sickness	
Illinois	1
Mumps	
Alabama	56
Arizona	19
California	2,211
Georgia	229
Idaho	6
Illinois	1,407
Iowa	228
Louisiana	8
Montana	2
Oregon	15
Rhode Island	4
South Dakota	94
Tennessee	293
Washington	480
Ophthalmia neonatorum	
California	1
Illinois	2
Tennessee	6
Paratyphoid fever	
Georgia	2
Louisiana	1
Oregon	1
Tennessee	1
Texas	8
Puerperal septicemia	
Illinois	11
Oregon	1
South Dakota	1
Washington	1
Rabies in animals	
Alabama	72
California	78
Illinois	19
Louisiana	9
Washington	10
Rabies in man	
Idaho	1
Illinois	2
Rocky Mountain spotted fever	
Montana	4
Oregon	1
Scabies	
Montana	3
Oregon	21
Tennessee	3
Washington	3
Septic sore throat:	
Arizona	3
California	26
Georgia	20
Illinois	47
Montana	3
North Carolina	7
Oregon	15
South Dakota	2
Tennessee	9
Washington	2
Tetanus	
Alabama	4
California	1
Illinois	2
Tennessee	1
Trachoma	
Arizona	31
California	7
Georgia	1
Illinois	3
Montana	86
Oregon	1
Tennessee	17
Trichinosis	
California	11
Illinois	3
Minnesota	6
Tularaemia	
Alabama	3
Arizona	1
Georgia	8
Illinois	10
Louisiana	5
Minnesota	2
Montana	1
North Carolina	4
Tennessee	4
Typhus fever	
Alabama	30
Georgia	29
Illinois	1
Louisiana	1
North Carolina	3
Undulant fever	
Alabama	2
Arizona	2
California	12
Georgia	3
Illinois	4
Iowa	5
Louisiana	2
Minnesota	4
Montana	1
North Carolina	3
Oregon	2
Washington	3
Vincent's infection:	
Illinois	30
Iowa	1
Oregon	9
Tennessee	12
Whooping cough:	
Alabama	481
Arizona	132
California	1,512
Georgia	260
Idaho	10
Illinois	1,465
Iowa	116
Louisiana	28
Minnesota	173
Montana	45
North Carolina	1,165
Oregon	131
Rhode Island	84
South Dakota	20
Tennessee	98
Washington	647
Yaws	
California	1

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar 17, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	1	4	4	0	0	1	40	36
New Hampshire											
Concord	0	------	0	32	1	0	0	0	0	3	14
Manchester	0	------	0	9	1	1	0	2	0	0	11
Nashua	1	------	0	1	0	2	0	0	0	0	-------
Vermont											
Barre	0	------	0	0	0	1	0	1	0	0	1
Burlington	0	------	0	0	0	2	0	0	0	5	8
Massachusetts											
Boston	3	------	0	350	33	47	0	7	1	87	243
Fall River	0	------	0	1	1	9	0	1	0	3	35
Springfield	0	------	0	3	4	9	0	1	0	13	37
Worcester	0	------	1	20	8	10	0	1	0	10	42
Rhode Island											
Pawtucket	0	------	0	0	0	2	0	0	0	0	0
Providence	0	------	0	0	4	0	0	2	0	0	67
Connecticut.											
Bridgeport	0	2	2	8	1	18	0	1	0	4	30
Hartford	1	------	0	0	4	9	0	0	0	0	25
New Haven	0	------	0	3	4	0	0	1	0	5	46
New York											
Buffalo	3	------	0	210	21	27	0	6	0	28	150
New York	24	29	15	82	182	340	0	81	4	105	1,668
Rochester	1	------	1	1	9	50	0	2	0	7	65
Syracuse	0	------	0	3	3	7	0	1	0	42	57
New Jersey											
Camden	3	1	0	124	6	5	0	2	0	0	35
Newark	1	4	0	5	6	27	0	1	0	45	91
Trenton	0	------	0	84	3	9	0	3	0	5	45
Pennsylvania.											
Philadelphia	5	10	5	1,441	60	117	0	25	0	66	548
Pittsburgh	5	4	1	107	32	32	0	4	0	37	168
Reading	1	------	0	2	6	7	0	1	0	13	33
Scranton	0	------	0	1	0	7	0	0	0	3	-------
Ohio											
Cincinnati	3	------	4	69	11	36	0	7	0	15	159
Cleveland	9	45	2	56	25	163	0	15	0	152	223
Columbus	4	2	2	3	5	32	0	0	0	28	101
Toledo	3	1	1	111	8	30	0	4	0	89	94
Indiana:											
Fort Wayne	5	------	0	5	0	16	0	0	0	2	21
Indianapolis	1	------	2	261	25	12	0	3	0	69	-------
South Bend	0	------	0	1	1	8	0	1	0	1	16
Terre Haute	0	------	0	1	3	1	0	0	0	0	23
Illinois.											
Chicago	2	6	4	128	67	287	0	44	0	211	752
Cicero	0	------	0	0	1	0	0	1	0	0	6
Springfield	4	2	0	284	5	2	0	1	0	6	36
Michigan.											
Detroit	8	6	4	36	44	201	0	23	1	134	296
Flint	0	------	0	16	10	109	0	0	0	1	31
Grand Rapids	0	------	1	8	1	36	0	0	0	9	31
Wisconsin											
Kenosha	0	------	0	0	0	21	0	0	0	2	5
Madison	2	------	1	5	------	7	0	------	0	32	29
Milwaukee	2	------	0	4	12	150	0	7	0	132	115
Racine	0	------	0	1	1	4	12	0	0	12	18
Superior	0	------	0	0	2	0	0	0	0	1	6
Minnesota.											
Duluth	0	------	0	0	1	7	0	1	0	0	21
Minneapolis	5	------	1	7	8	27	0	2	0	37	99
St. Paul	0	------	0	3	10	7	0	4	0	15	73
Iowa:											
Des Moines	0	------	-------	0	------	23	0	------	0	0	39
Sioux City	1	------	-------	15	------	0	0	------	0	1	-------
Waterloo	0	------	-------	0	------	0	0	------	0	7	-------
Missouri:											
Kansas City	2	------	0	10	25	18	0	7	0	18	106
St. Joseph	4	------	1	14	8	8	0	3	0	0	51
St. Louis	29	------	1	221	9	22	2	8	0	75	236

City reports for week ended Mar. 17, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Dakota											
Fargo	0	------	1	91	0	0	0	0	0	0	8
Grand Forks	0	------	0	0	0	0	0	0	0	0	------
South Dakota											
Aberdeen	0	------	0	9	0	0	0	0	0	11	------
Nebraska											
Omaha	0	------	0	193	5	9	0	0	0	13	61
Kansas											
Topeka	0	------	0	10	2	16	0	0	0	33	19
Wichita	0	------	0	7	3	8	0	1	0	14	26
Delaware											
Wilmington	1	------	0	79	6	0	0	2	0	4	41
Maryland											
Baltimore	3	7	3	519	27	33	0	17	2	186	251
Cumberland	0	------	0	1	1	1	0	0	0	5	16
Frederick	3	------	0	8	0	7	0	0	0	0	3
District of Columbia											
Washington	8	2	2	606	20	14	0	20	0	47	205
Virginia											
Lynchburg	1	------	0	1	0	1	0	0	0	5	9
Norfolk	[1] 1	------	0	198	9	2	0	2	0	10	39
Richmond	2	------	3	201	7	5	0	5	0	3	62
Roanoke	3	------	0	0	2	3	0	0	0	0	21
West Virginia											
Charleston	0	------	0	0	1	1	0	0	0	3	16
Huntington	1	------	0	0	0	15	0	0	0	0	------
Wheeling	0	------	0	1	5	24	0	0	0	8	19
North Carolina											
Raleigh	0	------	0	16	1	0	0	2	0	8	18
Wilmington	0	------	0	2	1	1	0	1	0	3	7
Winston-Salem	0	1	1	40	1	2	0	0	0	0	9
South Carolina											
Charleston	0	37	0	20	1	0	0	1	0	1	20
Columbia	------	------	------	------	------	------	------	------	------	------	------
Greenville	0	------	0	12	2	0	0	1	0	7	13
Georgia											
Atlanta	3	21	3	255	10	8	0	4	0	1	100
Brunswick	0	------	0	51	1	0	0	0	0	0	3
Savannah	1	53	0	65	3	1	0	1	1	6	28
Florida											
Miami	0	1	1	41	3	1	0	1	2	3	30
Tampa	0	1	1	29	4	1	0	1	0	0	34
Kentucky											
Ashland	0	------	------	3	------	0	0	------	0	1	------
Lexington	1	7	0	8	2	1	0	2	0	0	17
Louisville	3	------	0	2	8	29	0	0	0	20	65
Tennessee											
Memphis	2	------	2	267	15	9	2	3	0	5	92
Nashville	2	------	0	75	6	4	0	0	0	26	36
Alabama											
Birmingham	1	5	2	72	6	4	0	7	0	0	68
Mobile	0	------	1	15	3	0	0	1	0	0	31
Montgomery	0	------	------	42	------	1	0	------	2	0	------
Arkansas											
Fort Smith	0	------	------	31	------	0	0	------	0	0	------
Little Rock	0	------	0	52	0	0	0	0	0	1	1
Louisiana											
New Orleans	14	6	0	21	9	21	0	12	0	5	156
Shreveport	0	------	0	6	3	1	0	1	0	0	18
Oklahoma											
Oklahoma City	6	16	0	6	9	0	0	0	0	0	48
Texas											
Dallas	13	1	1	4	12	7	0	1	1	4	56
Fort Worth	4	------	2	4	5	3	0	1	3	0	35
Galveston	0	------	0	0	2	0	0	1	0	0	14
Houston	5	------	0	9	8	4	0	2	0	0	74
San Antonio	1	------	0	18	6	2	0	11	0	0	59
Montana											
Billings	0	------	0	0	0	0	0	0	0	0	7
Great Falls	0	------	0	2	3	0	0	0	0	3	4
Helena	0	------	0	0	0	1	0	0	1	0	8
Missoula	0	------	0	0	0	0	0	0	0	0	2
Idaho											
Boise	------	------	------	------	------	------	------	------	------	------	------

[1] Nonresident.

City reports for week ended Mar 17, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Colorado											
Denver	4	41	0	136	11	10	5	2	0	85	89
Pueblo	0	------	0	0	0	6	0	0	0	24	4
New Mexico											
Albuquerque	1	------	0	3	0	6	0	7	0	1	15
Utah											
Salt Lake City	0	------	0	326	3	6	0	1	0	46	43
Nevada											
Reno	0	------	0	0	0	0	0	1	0	0	2
Washington											
Seattle	0	------	------	2	4	28	0	3	0	88	90
Spokane	0	2	2	39	7	3	0	------	0	10	47
Tacoma	0	------	0	20	6	3	0	0	0	17	28
Oregon											
Portland	0	5	0	8	2	19	5	2	0	10	55
Salem	0	1	0	0	0	0	0	0	0	3	------
California											
Los Angeles	10	17	2	81	23	52	2	21	0	67	302
Sacramento	0	1	0	2	0	2	0	0	1	6	34
San Francisco	0	2	2	179	3	20	0	4	0	20	164

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
New York			
New York	1	0	1
New Jersey			
Trenton	1	0	0
Indiana			
Indianapolis	1	0	0
Illinois			
Chicago	3	0	0
Springfield	0	1	0
Wisconsin			
Milwaukee	1	1	0
Iowa			
Des Moines	1	0	0
Sioux City	[1] 3	0	0
North Dakota			
Fargo	0	1	0
Maryland			
Baltimore	1	0	0
Tennessee			
Memphis	1	1	0
Louisiana			
New Orleans	1	0	0
Texas			
Dallas	1	0	0
San Antonio	0	0	1
Utah			
Salt Lake City	0	1	0
California			
Los Angeles	1	0	5

[1] Two nonresidents.

Lethargic encephalitis —Cases. New York, 3, Madison, 1, Washington, 1, Birmingham, 1, New Orleans, 1.
Pellagra —Cases· Philadelphia, 1, Raleigh, 1, Atlanta, 1, Tampa, 1, Mobile, 1, New Orleans, 1
Typhus fever —Cases Atlanta, 1, Savannah, 1, Houston, 1.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended March 10, 1934.—During the 2 weeks ended March 10, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				1	2		2			5
Chicken pox		11	1	259	376	70	31	20	90	858
Diphtheria		2	1	43	22	7	4	1		80
Dysentery				1						1
Erysipelas				18	9	3	5			35
Influenza		61		13	28	12	4		37	155
Measles	6		1	234	55	396	115	3	34	844
Mumps		3	4		354	16	7	1	165	550
Paratyphoid fever					2				1	3
Pneumonia		14			33		7		18	72
Poliomyelitis							1			1
Scarlet fever		41	14	171	314	39	23	16	221	839
Smallpox						1				1
Trachoma							1		24	25
Tuberculosis	5	3	15	133	101	21	47	5	51	381
Typhoid fever			2	49	12	5	5		1	74
Undulant fever				1	2					3
Whooping cough		13	3	331	283	25	49	60	27	791

Quebec Province—Communicable diseases—2 weeks ended March 10, 1934—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended March 10, 1934, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Puerperal septicemia	2
Chicken pox	259	Scarlet fever	171
Diphtheria	43	Tuberculosis	133
Dysentery	1	Typhoid fever	49
Erysipelas	18	Undulant fever	1
German measles	30	Vincent's angina	2
Influenza	13	Whooping cough	331
Measles	204		

CUBA

Provinces—Notifiable diseases—4 weeks ended November 25, 1933.—During the 4 weeks ended November 25, 1933, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer			1	1		1	3
Chicken pox		1					1
Diphtheria		4	3	7	1	1	16
Hookworm disease				1			1
Malaria	114	66	352	1,904	222	1,568	4,226
Measles	1			1			2
Tuberculosis	2	4	14	37	11	25	93
Typhoid fever	5	14	12	62	20	17	130

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Mar 30, 1934, pp 438–450 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Apr 27, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands.—During the week ended March 24, 1934, cholera was reported in the Philippine Islands as follows: Bohol Province—Inabanga, 1 case, 1 death; Tubigon, 11 cases, 5 deaths. Occidental Negros Province—Escalante, 28 cases, 15 deaths; San Carlos, 6 cases, 4 deaths. Oriental Negros Province—Bais, 2 cases, 2 deaths; Tanjay, 3 deaths.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 15

APRIL 13 - - - - - 1934

IN THIS ISSUE

Summary of Current Prevalence of Communicable Diseases
Health Services of Tomorrow and Factors Determining Them
Deaths in Large Cities During the Week Ended March 24
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93; title 44, section 220

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public health work. Articles of special interest are issued as reprints or as supplements, in which forms they are made available for more economical and general distribution.

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CONTENTS

	Page
Current prevalence of communicable diseases in the United States—February 25–March 24, 1934	475
Health services of tomorrow	477
Court decision on public health	487
Deaths during week ended March 24, 1934	
Deaths and death rates for a group of large cities in the United States	487
Death claims reported by insurance companies	487
PREVALENCE OF DISEASE	
United States	
Current weekly State reports	
Reports for weeks ended March 31, 1934, and April 1, 1933	488
Summary of monthly reports from States	490
Weekly reports from cities	
City reports for week ended March 24, 1934	491
Foreign and insular	
Australia—Notifiable diseases—Year 1933	494
Cuba—	
Provinces—Notifiable diseases—5 weeks ended December 30, 1933	494
Habana—Communicable diseases—4 weeks ended March 24, 1934	494
Great Britain—England and Wales—	
Vital statistics—October–December 1933	495
Infectious diseases—13 weeks ended December 30, 1933	495
Italy—Communicable diseases—4 weeks ended October 15, 1933	495
Cholera, plague, smallpox, typhus fever, and yellow fever—	
Cholera	496
Plague	496
Smallpox	496

PUBLIC HEALTH REPORTS

VOL. 49 APRIL 13, 1934 NO. 15

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES [1]

February 25–March 24, 1934

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease"

Measles —The number of cases of measles rose from 94,984 for the preceding 4-week period to 129,505 for the 4 weeks ended March 24. All sections of the country contributed to the increase This is the highest incidence for this period in the recent years for which records are available

While for the country as a whole the current incidence was only about twice that for the corresponding period last year, the increases in certain geographic areas were much larger. In the South Atlantic group of States the number of cases reported (34,322) was 6 times last year's figure for the same period, in the West South Central area the number (13,866) was 3.4 times last year's figure, and in the Mountain area the number (4,700) was 5.6 times that of last year. While the increases were not so large in other areas, practically all reported a little higher incidence than has occurred in recent years.

Meningococcus meningitis —For the current period there were 225 cases of meningococcus meningitis reported, about 57 percent of the number for the same period last year. For this period in 1932, 1931, and 1930 the numbers of cases were 296, 682, and 1,211, respectively. The only region showing an increase over last year was the South Atlantic. Of the 29 cases in that group of States, Virginia reported 17 cases for the current period as against 8 last year.

Smallpox —Smallpox maintained the relatively low level of the preceding 4-week periods of the current year. For the entire reporting area there were 622 cases, as compared with 810, 1,413, and 3,750 for

[1] From the Office of Statistical Investigations, U S Public Health Service The numbers of States included for the various diseases are as follows Typhoid fever, 48, poliomyelitis, 48; meningococcus meningitis, 48, smallpox, 48, measles, 47, diphtheria, 48, scarlet fever, 48, influenza, 43 States and New York City The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers

the corresponding period in the years 1933, 1932, and 1931, respectively For this period in 1930 the number of cases was 6,520. The East North Central and South Central areas reported practically the same number of cases as for this period last year, but, as in all other areas, the incidence was considerably below that of the preceding years.

Typhoid fever.—Typhoid fever was about normal for the current period—508 cases, as compared with 545 for the corresponding period last year, 693 for 1932, and 475 for 1931 The South Central area reported a 10 percent increase over last year's figure, but the incidence in other areas closely approximated that of last year

Scarlet fever—The incidence of scarlet fever during the 4 weeks ended March 24 was also approximately normal—26,522 cases, as compared with 26,549 for the corresponding period last year and 25,427 in 1932 The New England and Middle Atlantic groups reported a 25 percent increase over last year's figure, but in all other areas the incidence was practically the same as that for the same period last year.

Poliomyelitis—For the current 4-week period 73 cases of poliomyelitis were reported, which was about 45 percent higher than the figure for the corresponding period last year and 10 percent in excess of that in 1932. In all areas except the West North Central and Pacific the current incidence was on a level with that of last year. In the West North Central section, while the number of cases (8) was not large, it was 3 times that reported for the same period last year, and in the Pacific area the number of cases (24) was 3 4 times that of last year California reported 19 out of the 24 cases

Influenza—For the 4 weeks ended March 24 there were reported 11,259 cases of influenza, as compared with 10,329, 36,383, and 25,635 for the corresponding period in the years 1933, 1932, and 1931, respectively With the exception of Missouri in the West North Central and Texas in the West South Central area, where there were considerable increases over last year, the influenza incidence has maintained a very satisfactory level in all parts of the country The current incidence is very close to the average for years which have been free from epidemics.

Diphtheria.—The incidence of diphtheria, which has continually declined in recent years, is now maintaining the level of last year The number of cases (2,845) for this period was approximately the same as for the corresponding period last year, as was the case in the preceding 4-week period. There were 3,971, 4,035, and 5,350 cases reported in the corresponding period of the years 1932, 1931, and 1930, respectively. The diphtheria situation was favorable in all sections of the country. The South Atlantic and West South Central regions showed some increases, but they were very insignificant.

Mortality, all causes—The average mortality rate from all causes in large cities for the 4 weeks ended March 24, as reported by the Bureau of the Census, was 12 8 per 1,000 inhabitants (annual basis). For this period in 1933, 1932, and 1931 the rates were 11.8, 13.5, and 13 7, respectively

HEALTH SERVICES OF TOMORROW[1]

By Thomas Parran, Jr, M D, *New York State Commissioner of Health*

It is not my purpose in this discussion either to attack or to defend current public health practice, nor have I any criticism whatever for the attitude of physicians concerning it I feel that we have had enough of controversy, that in order to obtain a perspective of our several problems, we need to detach them, at least momentarily, from the exigencies of personal opinions and desires It would seem to me that through a greater objectivity we may arrive at a clearer understanding of the past developments and present status of public health service On the basis of that understanding, we should be able to analyze the trends of such service and to project the line of probable action In the last analysis, each man must think this through for himself He may find, as I have found in my effort to arrive at an objective interpretation, that his judgment of what is probable conflicts from time to time with his personal philosophy Under such circumstances his acceptance of or opposition to the course of events must be predicated upon his intellectual honesty.

In the nation at large there is more than the usual need for open-mindedness, for respect for the point of view unlike our own, as well as a courageous tenacity in adhering to what is truly valuable in established methods That widely divergent views are held by many, physicians and laymen alike, concerning various public aspects of medicine, no one can deny. Today's forum serves to crystallize these views and should give all of us a broader concept

On both sides of the controversy we can assume for the most part a sincere desire for medical progress, for better and more complete health services to all the people. Where disagreement exists, it concerns the methods and procedures which will contribute to this progress so ardently desired by all of us Incomplete information and misinformation fan the flame Extremists, whether reactionary or radical, do not contribute to progress. The usual result of their labors is to impede it.

It is well to bear in mind that our individual or collective views as doctors have had little weight in the past. Unless we improve the technique of making our views felt, they will have little weight in the

[1] Read before the Joint Conference of the American Academy of Political and Social Science and the College of Physicians of Philadelphia, Philadelphia, Pa, Feb 7, 1934.

future determination of the structure, scope, or content of public health The people of each day and generation place an increasingly higher value on medical service. It would seem, however, that they consider themselves, as patients, as important a factor of medical service as we are In consequence the medical profession conforms to the social system of which it is a part Sigerist, expressing this point of view, recently said

There is one lesson that can be derived from history It is this that the physician's position in society is never determined by the physician himself, but by the society he is serving We can oppose the development, we can retard it, but we will be unable to stop it

From this there is apparent not only the futility of obstructing change but also of championing reforms which go beyond the current concepts of social responsibility It is time that men should look to physicians themselves for guidance upon medical matters of public concern as well as those of private urgency Nevertheless, the direction and distance we can lead toward a specific type of health service for tomorrow is limited sharply by the framework of tomorrow's social concepts.

Today's official health services reflect rather accurately our character as a nation

Their diversity of form is in keeping with a similar diversity of political and social organization among the States, and even within a State.

Their incompleteness parallels the lack of concern for human rights and lack of confidence in government as an instrument for protecting human rights, which until recently characterized the popular mind

Their individualistic idiosyncracies show, both in their weakness and in their strength, precisely the lack of regimentation which is to be expected from a nation of individualists.

Their sectional differences represent a difference in problems. Industrialization has brought the need for compensation and safety laws, unavoidable incursions into the health field. The transition from an agrarian to an industrial civilization brings a greater need for health service Exotic diseases have given an impetus to public health work in the South. Many of the Western States, free from the yellow fever and the hookworm of the South, have been until recently too preoccupied with frontier problems to organize more than a perfunctory health service.

Tradition, too, has left its mark. The town meeting of early New England is reflected in the multiplicity of local health officers now found in these and adjacent States. Custom, also, helps to determine the quality and kind of service rendered In many States and cities a change of administration entails a clean sweep in health department officials and major employees. Services periodically are disrupted and

no long-range programs undertaken In other States (New York is an example) it has become the custom to consider the health problem nonpartisan The State health department has passed through many successive administrations without political changes in personnel or policy Where partisan politics control the health department, there is the same control of other community services

The lack of real professional leadership among those rendering health service probably is analogous to that in the medical profession as a whole; which, in turn, may be due to the low standards of professional education which prevailed until recent years among the rank and file

If we add to these factors the difficulties of scientific appraisal inherent in many aspects of health service, as in many phases of medical practice, the gap between the present and the ideal in this country is easily understood

Public health, too, is founded upon scientific discoveries which are comparatively recent There is an inevitable cultural lag between the acquisition of knowledge and its application to the community, and, although the desire for life and health is a basic human emotion, the absence of disease, the prevention of an epidemic, the saving of life generally are rated as negative accomplishments. They are not dramatized in the public consciousness

For a long time statesmen have expressed the thought that the care of the public health is a primary responsibility of government Blackstone interpreted the legalistic aspect when he said: "The right to the enjoyment of health is a subdivision of the right of personal liberty, one of the absolute rights of persons"

These concepts mean that the community collectively should perform for its citizens (1) those services which are so important to the social organism that they cannot safely be left to the initiative of the individual uneducated or indifferent as to their importance and (2) those services which, because of their nature, the individual cannot provide for himself. So far, however, the performance of such services is more theory than fact Public health has not been a major issue of our Government in the past At the present time, when all human issues are coming to the fore, economic pressure—the necessity of providing a world fit to live in—has continued to shunt aside from public consciousness the present needless sacrifice of human life and efficiency by our inadequate use of scientific medicine Current measures to restore minimum standards of living, however, are doing more to preserve the mental and physical health of the Nation than a frontal attack on disease alone

Unfortunately, we have inaction and retrogression even in functions, such as control of communicable disease, which are generally accepted as appropriate spheres for governmental action; and in the

line of private health protection, citizens have become increasingly unable to provide necessary medical service for themselves

The distribution of present health and medical expenditures is distinctly inequitable, only 3 percent of the total being made for preventive services, public and private Out of a total per capita expenditure each year of $30 for all medical care, only $1 is spent for prevention Quacks, nostrums, and patent medicines collect too large a part of the remainder

Public health has not generally attracted the best of medical graduates. It has not in the past offered a satisfactory career because the financial rewards were modest and the openings not influenced by partisan politics were few Before we can realize a completely sound health plan for tomorrow, we must raise up a new generation, not only of leaders but of well-trained men in the ranks

Funds for the work have been scanty Three fourths of our rural population have not even the elements of a public health service. Between 1931 and 1932 health budgets in cities and States, already inadequate for the proper conduct of minimum activities, declined, on the average, 17 percent In Alabama the cut was 50 percent; in Mississippi and North Dakota, 75 percent

It is true that remarkable accomplishments have been made in the prevention of disease during the past 2 decades; but it is likewise true that these accomplishments are less than half of what is easily possible if all communities would provide for their citizens the health protective facilities now provided by a few communities.

A further increase in the life span by another 10 years is entirely possible. Of even greater economic importance are the disease and disability which can be prevented Typhoid fever and diphtheria can be reduced to lower minima, the infant mortality rate can still be cut in half, two thirds of the present 13,000 maternal deaths can be prevented, the increasing incidence of the venereal diseases can be changed to a decreasing progression, the tuberculosis battle is only half won, and cancer can be better controlled.

The medical profession, as at present constituted, is increasingly unable to provide for all the people the minimum essentials of medical care without adding unbearably to the load of poorly paid and unpaid work it now carries. Three factors have contributed to this situation. First, although many human ailments can be treated satisfactorily with limited equipment, scientific advances have increased constantly the complexity and the cost of medical service Second, the lowered income of a large part of the population has put medical care beyond the reach of an increasing number. As a result, many physicians, and dentists and nurses as well, find themselves today almost destitute. Third, people who are not ill and not confronted by a threat of illness

are unwilling or uneducated to pay out of pocket for a preventive service

Few will deny that our health system falls woefully short of results; yet there are those who would limit public health service to sanitation, quarantine, and the care of the insane and of other indigent sick. To accept this view is to ignore not only the inherent responsibility of government but the scientific factors and our considerable experience in public medical care The quality of such service compares favorably with private treatment for the same class of patients in tuberculosis sanatoria, mental disease hospitals, venereal disease clinics, public general hospitals, and immunization clinics

It is no longer easy to secure applause by damning the Government because of its interference, without presenting valid evidence that alone and unaided by Government we can do a better job

We may consider the potential scope of public health service as the application of biologic knowledge for the prevention and cure of disease and the promotion of health. In forecasting the health services of tomorrow, we need to determine what functions the Government can exercise better than other agencies to serve the health needs of the people. Society as a whole is indifferent to the squabble between public health officialdom and the medical hierarchy concerning the prerogatives of each What happens to our present public health system or to the private practice of medicine, as we know them both today, will not be determined by the resolutions of medical societies nor by the recommendations of health officers

It seems generally agreed that the current social and economic revolution cannot stop where it is. Are we to go forward during the coming years, veer left or right? We will not go back We must assume that in any event we have faith in our capacity to adjust governmental forms to serve the people better than in the immediate past

First, it is possible that the speedy return of economic prosperity may be accompanied by a revolt of trade and industry against onerous governmental control As a result we may emerge with many of the forms and much of the formlessness of yesterday, the chief social residue of the recent tragic era being a somewhat better conception of individual rights and some means of preventing the more flagrant abuses and exploitations of those rights.

There is a second contingency—that we may continue our present trend toward a regulated capitalism with trade associations and cartels operating the economic system of the country under Government regulation and control In such a system cooperative effort will be the dominant factor.

It must also be considered that we may show an incapacity for cooperative capitalistic effort. We may revolt against rigid regula-

tion which fails to bring high profits in its wake Recently, in an informal discussion of the subject, I heard a business man of major rank intimate that business as a whole may prove itself too dishonest to function under the regulations of an industrially controlled system What then? Perhaps chaos as an interlude, but ultimately and possibly soon, a socialistic state

Whatever the path we take, regardless of how earnestly as doctors we may fight for it or against it, the health service of tomorrow inevitably will conform to the governmental framework, whatever it may be

If the political philosophy of yesterday again prevails, we shall, of course, continue the traditional forms of medicine and public health The State will perform more completely, and better, I hope, the services which it now undertakes New tasks will be added as the developing body of scientific knowledge and the needs of the people determine.

An essential part of this system, in my opinion, is the tools for better work which can be placed in the hands of the practicing physician. Among the aids which the most individualistic of doctors, in large numbers, have approved and used are the following: County general hospitals, managed by local medical boards and open to all citizens at a cost within their means, diagnostic laboratories, for clinical as well as communicable disease diagnosis, free biologic products and arsphenamines, community nursing; plus case finding and consultation service

Such accessories to care as X-ray, laboratory, nursing, and hospital costs often outweigh the actual medical charges If these accessories are furnished by the community, the medical bill frequently can be paid, the personal relationship of physician and patient retained, and the quality of medical service promoted For it must be remembered that a patient may be able and willing to pay for an office call or for attendance at childbirth, yet be unable to negotiate for a cancer operation or the rehabilitation of a crippled child. For this reason it may prove very serviceable to the general practitioner for tax levies to supplement inadequate private subscriptions for the support of hospital and dispensary service; and for facilities now provided for the care of the insane, the aged, the tuberculous, and the venereally infected to be extended to other chronic and, therefore, expensive diseases.

But even under an economic system restored to familiar patterns there is an uncertain medical factor. During past months there have been some 5,000,000 families—about 18 percent of the population—receiving from public funds all the necessities of life, including medical care. Under the happiest of conditions their restoration to self-support will be gradual. Having accepted free and, in about one third of the States, moderately adequate medical care—in many

instances more freely available than in their whole previous experience, and of better quality than provided by the quacks and other questionable practitioners so often patronized by those in the lower income classes—will they, having experienced such care, continue to insist upon it? The history of benefits to veterans gives us food for serious thought on this subject

Under the traditional system the problem will grow more acute as to how both preventive and treatment needs will be met for the lower income classes Medical societies will continue to advocate payment of fees from taxes to physicians for these purposes The bogey of "State medicine" has been removed by acceptance of this principle. All of us now agree that public—that is, tax-supported—action is necessary Witness the enthusiasm with which the Detroit plan has received medical approbation.

With acceptance of this principle there remain only three relatively minor issues as to method First, should a particular service be rendered in the home and the doctor's office by any qualified physician on a fee basis paid by the public, or should it be rendered by part-time or full-time physicians? This issue will be resolved very simply. The taxpayer will choose the method which gives a satisfactory service at the lowest cost This will vary, but, in general, experience has shown that preventive services now rendered by health departments can be done reasonably well and least expensively by organized clinics. In rural areas, on the other hand, the fee for service basis may prove best for certain disease conditions. We have not arrived at our present situation fortuitously.

It is agreed that individual attention, whether preventive or curative, by a skilled and interested physician is the best type of medical care. We should each of us prefer it, just as we should prefer a special nurse and a private hospital room, if we can afford it, when we ourselves are ill Yet if we cannot pay for anything better, there is nothing inherently vicious about the general nursing service, the ward room, or preventive care and treatment in the clinic when otherwise the community and the individual would suffer from no service at all In fact, provable progress against disease prevalence has been made thereby Further, we can find skilled and interested physicians in the public service who treat patients as well as problems; we can find unskillful, uninterested physicians in private service to whom the patient is but a means for filling the pocketbook. The quality of any service depends upon the integrity and ability of its personnel. Neither public nor private medical service is all good or all bad.

The second issue in public medical care is at what income level shall we draw the line of eligibility? In measures to control a communicable disease the primary purpose is to protect the community. Hence, ability to pay for the treatment of smallpox or bubonic plague

is purely a secondary consideration Also, "ability to pay" for general medical care varies with the nature of the condition and therefore the cost of treatment

A third issue is whether needed public medical service should be administered by a department of social welfare or by a department of health I hold very strongly to the view that all public medical and health work should be done by the health department Here we have the medical foundation which is lacking among social workers Counterbalancing this, however, the social workers make out a good case for unifying medical relief with other relief and social reconstruction measures This argument, plus the continued barrage of some medical groups to make prevention and not cure the objective of health service, may reduce health departments to the status of sanitary police, while the major health-promoting functions of the community are carried on by non-medical welfare agencies

It is an interesting anomaly that if we move ahead and to the right, politically, the current of traditional medicine seems to carry the private practitioner farther and farther away from responsibility for preventive medicine in general and for treatment of disease which, if neglected, would be harmful to the community either because of its infectious nature or because the untreated individual or his family might become a public charge The reason is simple The doctor, of his own volition, has rendered long and valiant service for the poor and needy Yet bound down as he is by the competitive system, we cannot expect him to assume the load of preventive services—nor do we find him volunteering to do it—when he finds it difficult to obtain reasonable compensation for what he does Neither can the doctor's benevolence absorb the vast strata of those victims of technological maladministration whose sole asset is an uncertain wage at or below the bleakest living requirement

If tax funds are available for the treatment of these cases, it is probable that the taxpayers' insistence on economy will result in the expenditure of these funds largely through the organized clinic rather than in the doctor's office, and for salaried physicians rather than fees for service.

If, on the other hand, the current economic revolution leads ahead, and left to a regulated capitalism, with industrial cooperation under Government control, then we almost certainly shall see various schemes of social insurance—old age, unemployment, and sickness

The contest in this case will be over the nature and extent of supervision of the service, the extent of tax support, the freedom of choice and compensation of the physician, the restrictions on specialization, the voluntary or compulsory nature of the system, and the inclusion of cash as well as medical benefits.

Where most successful, sickness insurance requires the general practitioner as the keystone in providing a preventive and general medical service to the family as a unit, with reasonable and assured compensation. The work of health departments would be proportionately minimized in the treatment field as these services, paid for in advance, are available from the family physician

In fact, is it not possible that the medical profession itself will be the prime advocate of sickness insurance as the least objectionable way of preserving the general practitioner and of attaining economic security? Here, then, is the paradox As we move ahead along traditional lines, private medical practice is forced away from its preventive and many of its treatment functions by an expanding public health service As we move to the left by abandoning traditional forms, private medical practice regains its traditional inclusive responsibility for both prevention and treatment, with a corresponding reduction in the scope of health-department functions

The program of the British Medical Association entitled "A Medical Service for the Nation" deserves consideration if we anticipate this state of society

If, through evolution or revolution we find ourselves to the extreme left and part of a socialist state tomorrow, then we doctors, too, will be socialists. Or, if we are not, our successors will be. State medicine will exist in the sense that the State will operate medical and health services in a manner comparable to our present system of public education The medical recommendations contained in the platform of the British Labor Party give at least a rough idea of what this would be like. Or, if we recognize obvious differences in the level of medicine here and in Russia at the beginning of the World War, we may find some suggestions in the medical organization of that country.

What, then, is a doctor to do in a changing world? Is he to fight all suggested innovations as encroachments upon his livelihood? Will he have a voice in his own salvation, or is he but dust upon the wheel of circumstance?

You will notice that I said "doctor", not "private doctor", or "public health doctor" Good or bad, we are cut from the same cloth. We face transition of status and opportunity that will be far-reaching for each of us; but, as I said in the beginning, every man must think out for himself what lies ahead and what his personal attitude toward it will be. To my mind, these are the attitudes of an honest, earnest, well-trained doctor of today:

He is unafraid. The doctor's job, whether his present concern is private practice or public health, is of paramount importance in the Nation's welfare. Whatever the political framework of tomorrow, there will be a place for him and a place in the sun.

He continues to learn He feels a maladjustment in the society he serves, and he seeks to understand it in the whole as well as in part He considers with an open mind at least two sides of a suggestion—his own and the patient's He is eager for new information, he faces facts.

He participates If he is a practicing physician he is active in obtaining and maintaining a first-class health department for his community If it is partisan-ridden, he helps to turn the rascals out and to change the rules so that a good job is possible If he is a health officer, he keeps close to clinical medicine and medical research He takes counsel with private physicians, he is familiar with their problems

He plays fair He is not petty himself nor will he tolerate the factional bitterness which has made so many a medical organization the synonym for strife

And last, he looks ahead, in terms of the community and the Nation, as well as of himself and his profession He is a good citizen

You may think I have discussed a tomorrow that is too far away Time alone can determine.

What I have attempted to do is to consider alternate political systems of which we will be a part, and to suggest different types of medical and health services within the framework which society places around us

I have said that as doctors—as guild members—we have not in the past influenced the social structure in which we find ourselves; nor are our resolutions or recommendations likely to mold it tomorrow. When we speak as doctors alone, we have been suspected of self-interest. Yet as citizens we have full voice in the new order of things, and as doctors it is possible for us to implant in every citizen a respect for scientific medicine, for its potentialities, and for its practitioners, which will make easy the adjustments of tomorrow.

What we need is more evangelism in medicine, more concern for the citizen unserved, or poorly served. What we have had is a virulent sectarianism, a concern lest he be served by others who receive the reward.

Let us, then, study the needs of the people for health, consider the service which science has made possible, and interpret to the people the best ways of applying science to health promotion. In doing this let us keep in mind two principles:

1. Progress made through evolution rests on a sounder basis than when the change is revolutionary.

2. The form of a program is not so important as the spirit. Drawn today, it may need to be modified tomorrow; but the ideals of that program, the spirit which conceived it, must be as unchanging as the tides.

COURT DECISION ON PUBLIC HEALTH

Ordinance prohibiting slaughter of chickens for sale in city held unconstitutional.—(Ohio Court of Appeals, *Simon* v. *City of Cleveland Heights*, 188 N.E. 308, decided Oct. 23, 1933.) An ordinance of the city of Cleveland Heights, among other things, provided that "no such animal or fowl [including chickens] shall be slaughtered for sale in the city." The plaintiff in error was convicted of violating this provision of the ordinance and he appealed to the court of appeals. The evidence established that his place of business, located within one of the business districts, was conducted in a clean and sanitary manner in a modern establishment for the slaughter of chickens and that there were no odors outside the said place of business. The evidence did not even suggest that any of the neighbors or inhabitants were annoyed by noises or odors in connection with the place, and the counsel for the city conceded that it was not a nuisance per se. The appellate court stated that, where others were not materially injured or annoyed by the conduct of a lawful business, an ordinance prohibiting that business could well be said to infringe upon the rights of property guaranteed by the State and Federal constitutions and existing in the individual. Proceeding, the court said:

Where a business by reason of its inherent character is a nuisance per se, such business may be prohibited by the exercise of the police power with a view to suppressing the same. If, however, it is not a nuisance per se, but may become a nuisance by reason of its method or manner of conducting such business, then the police power may be invoked to regulate such business.

In the case at bar, the last clause of that portion of the ordinance above quoted, under which the conviction was obtained, does not attempt to regulate the business as to the location or method of operation, but it in fact expressly prohibits the conduct of a lawful business. It is not a regulatory measure, but a complete prohibition. Insofar as this ordinance undertakes to prohibit the slaughtering of chickens in the city of Cleveland Heights for sale, we think that it is an unreasonable exercise of the police power and is unconstitutional.

The conviction was set aside and the plaintiff in error discharged.

DEATHS DURING WEEK ENDED MARCH 24, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar. 24, 1934	Corresponding week, 1933
Data from 86 large cities of the United States:		
Total deaths	8,974	8,404
Deaths per 1,000 population, annual basis	12.5	11.7
Deaths under 1 year of age	619	611
Deaths under 1 year of age per 1,000 estimated live births	58	[1] 53
Deaths per 1,000 population, annual basis, first 12 weeks of year	12.7	12.3
Data from industrial insurance companies:		
Policies in force	67,654,813	68,730,271
Number of death claims	14,905	14,138
Death claims per 1,000 policies in force, annual rate	11.5	10.7
Death claims per 1,000 policies, first 12 weeks of year, annual rate	11.1	11.2

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Mar. 31, 1934, and Apr. 1, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar 31, 1934, and Apr 1, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933
New England States								
Maine		5		4	13		0	0
New Hampshire					125		0	0
Vermont		1			72	14	0	0
Massachusetts	15	15		6	2,223	307	2	1
Rhode Island	3	3		2	2		0	0
Connecticut	6	10	1	11	34	214	0	0
Middle Atlantic States								
New York	37	67	[1] 24	[1] 37	1,179	4,317	6	3
New Jersey	22	22	9	20	429	1,882	0	4
Pennsylvania [2]	41	52			3,059	1,818	0	7
East North Central States								
Ohio	52	45	137	194	1,294	821	6	3
Indiana	19	18	28	43	855	134	1	7
Illinois	22	43	26	60	1,869	575	15	17
Michigan	22	19	9	3	146	1,256	1	2
Wisconsin	1	3	48	59	1,813	387	4	3
West North Central States								
Minnesota	5	13	3	3	232	1,187	1	0
Iowa [1]	6	4	17		151	11	5	2
Missouri	45	25	63	8	699	233	4	0
North Dakota			2		85	14	0	0
South Dakota	3		6		495	7	1	6
Nebraska	3	8	1		221	24	0	1
Kansas	4	5	7		411	316	1	1
South Atlantic States								
Delaware	2	4			131	13	0	0
Maryland	10	9	18	18	1,102	53	0	1
District of Columbia	9	4	1	1	596	4	1	0
Virginia	21	11			976	380	4	2
West Virginia	4	13	74	33	104	117	4	1
North Carolina	16	12	81	23	2,886	600	1	1
South Carolina	18	8	693	434	902	269	0	0
Georgia [1]	14	11		96	1,444	81	0	3
Florida	6	12	6	12	476	53	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar 31, 1934, and Apr 1, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933
East South Central States								
Kentucky	16	12	47	24	691	99	0	2
Tennessee	8	12	74	156	1 314	80	1	4
Alabama [3]	25	8	82	37	765	66	0	0
Mississippi	6	6					0	0
West South Central States								
Arkansas	3	7	57	39	388	144	0	1
Louisiana	18	7	3	11	223	104	0	1
Oklahoma [4]	13	7	66	78	680	88	1	3
Texas [3]	91	104	389	290	1,372	1,209	2	3
Mountain States								
Montana	2	1		9	24	33	0	1
Idaho	1				109	20	1	0
Wyoming [5]					112	2	0	0
Colorado	9	5		31	367	12	0	1
New Mexico	11	2	11	16	201	4	0	1
Arizona		5	12		18	41	0	0
Utah [2]		6	6		768	1	0	1
Pacific States								
Washington	1	8	2		173	64	0	1
Oregon [6]	1	1	48	31	52	72	0	0
California [3]	45	39	39	52	798	1,272	2	5
Total	656	672	2,090	1,861	32,082	18,398	64	89

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933
New England States								
Maine	0	0	11	26	0	0	28	1
New Hampshire	1	0	18	19	0	0	0	0
Vermont	0	0	10	11	0	1	0	0
Massachusetts	1	0	266	53	0	0	0	3
Rhode Island	0	0	14	37	0	0	0	0
Connecticut	0	0	65	167	0	1	0	2
Middle Atlantic States								
New York	0	0	862	1,120	0	0	10	3
New Jersey	0	0	185	377	0	1	0	3
Pennsylvania [2]	0	1	622	1,090	0	0	4	5
East North Central States								
Ohio	1	1	1,204	1,538	0	29	6	2
Indiana	0	1	274	265	3	1	1	3
Illinois	2	0	612	565	3	15	4	4
Michigan	0	0	805	673	0	1	3	4
Wisconsin	1	0	234	124	28	17	7	1
West North Central States								
Minnesota	1	0	57	107	1	0	0	2
Iowa [4]	0	1	62	31	6	22	1	0
Missouri	1	0	126	87	6	0	4	1
North Dakota	0	1	52	11	0	0	0	0
South Dakota	0	0	29	6	5	0	1	4
Nebraska	0	0	39	20	9	0	0	0
Kansas	0	1	58	67	1	0	0	1
South Atlantic States								
Delaware	0	0	7	12	0	0	2	0
Maryland	0	0	90	117	0	0	2	4
District of Columbia	0	0	16	17	0	0	0	0
Virginia	1	0	42	43	1	0	3	3
West Virginia	0	0	101	39	0	0	2	3
North Carolina	1	0	22	53	0	1	4	3
South Carolina	0	0	5	3	3	1	4	6
Georgia [4]	0	0	19	8	1	4	6	8
Florida	0	0	2	15	0	0	3	22

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Mar 31, 1934, and Apr 1, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933	Week ended Mar 31, 1934	Week ended Apr 1, 1933
East South Central States								
Kentucky	1	0	79	70	0	1	2	7
Tennessee	1	0	27	39	0	0	6	4
Alabama [3]	1	0	9	14	0	1	0	5
Mississippi	0	0	11	2	2	0	4	7
West South Central States								
Arkansas	0	0	5	8	0	3	1	2
Louisiana	0	0	15	13	1	1	6	21
Oklahoma [4]	0	1	26	18	2	2	4	5
Texas [3]	1	0	117	86	27	39	17	16
Mountain States								
Montana	0	1	4	10	0	0	0	0
Idaho	0	0	6	1	13	4	0	3
Wyoming [5]	0	0	14	14	2	0	0	3
Colorado	0	0	23	68	13	6	0	2
New Mexico	1	0	31	8	4	0	1	5
Arizona	0	0	17	21	1	0	1	2
Utah [2]	0	0	12	6	0	0	0	0
Pacific States								
Washington	1	1	53	53	12	2	2	0
Oregon [5]	0	0	22	21	16	10	1	2
California [3]	3	2	159	167	1	50	8	2
Total	19	11	6,539	7,320	161	213	148	174

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended Mar 31, 1934, 7 cases, as follows Georgia, 2, Alabama, 1, Texas, 3, California 1
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended Mar 31, 1934, 12 cases, as follows Wyoming, 4, Oregon, 8

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1934										
New Hampshire		2	4				0	76	0	0
February 1934										
Kansas	9	62	22	1	596		0	400	13	5
Nevada		1	20		60		0	25	0	1
Oklahoma [1]	8	66	631	12	1,985	2	0	85	21	13
Puerto Rico		76	61	2,157	63		0		0	31
Virginia	10	103	842	1	3,385	6	2	257	1	14
Wisconsin	12	28	422		4,165		0	897	153	7

[1] Exclusive of Oklahoma City and Tulsa.

February 1934

	Cases
Actinomycosis	
Kansas	1
Chicken pox	
Kansas	535
Nevada	13
Oklahoma [1]	103
Puerto Rico	204
Virginia	393
Wisconsin	1,916
Diarrhea and dysentery	
Virginia	52
Dysentery	
Kansas (amoebic)	1
Puerto Rico	98
Filariasis	
Puerto Rico	4
German measles	
Kansas	66
Wisconsin	237
Hookworm disease	
Oklahoma [1]	1
Impetigo contagiosa	
Kansas	3
Leprosy	
Puerto Rico	2
Lethargic encephalitis	
Kansas	5
Virginia	5
Wisconsin	2
Mumps	
Kansas	666
Nevada	8
Oklahoma [1]	80
Puerto Rico	5
Virginia	170
Wisconsin	138
Ophthalmia neonatorum	
Oklahoma [1]	1
Puerto Rico	7
Virginia	4
Wisconsin	2
Paratyphoid fever	
Puerto Rico	5
Virginia	2
Puerperal septicemia	
Puerto Rico	11
Scabies	
Oklahoma [1]	25
Septic sore throat	
Virginia	7
Tetanus	
Kansas	1
Puerto Rico	12
Tetanus, infantile	
Puerto Rico	5
Trachoma	
Oklahoma [1]	2
Puerto Rico	43
Tularaemia	
Virginia	3
Undulant fever	
Kansas	2
Oklahoma [1]	2
Virginia	2
Wisconsin	1
Vincent's infection	
Kansas	5
Oklahoma [1]	1
Virginia	6
Whooping cough	
Kansas	440
Nevada	104
Oklahoma [1]	77
Puerto Rico	417
Virginia	362
Wisconsin	1,458

[1] Exclusive of Oklahoma City and Tulsa

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar 24, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	6	1	0	0	1	8	26
New Hampshire:											
Concord	0	------	0	84	1	0	0	0	0	2	14
Nashua	0	------	0	2	0	5	0	0	0	0	--------
Vermont											
Barre	0	------	0	0	0	0	0	0	0	0	2
Burlington	0	------	0	0	0	5	0	0	1	19	16
Massachusetts:											
Boston	2	------	2	455	25	53	0	9	0	69	226
Fall River	2	------	0	2	2	3	0	0	0	3	20
Springfield	1	------	0	9	0	3	0	2	0	15	43
Worcester	1	------	0	7	11	14	0	0	0	14	50
Rhode Island											
Pawtucket	0	------	0	0	0	2	0	0	0	0	15
Providence	1	------	0	3	6	7	0	3	0	21	55
Connecticut											
Bridgeport	0	------	0	4	2	18	0	1	0	1	30
Hartford	1	------	0	0	5	13	0	2	0	0	60
New Haven	1	------	0	0	3	4	0	0	0	1	41
New York											
Buffalo	3	------	2	193	13	19	0	8	0	0	166
New York	41	19	14	118	176	356	0	92	4	160	1,649
Rochester	3	------	0	2	6	67	0	2	0	8	73
Syracuse	0	------	0	11	3	6	0	0	0	60	51
New Jersey											
Camden	1	1	2	107	4	14	0	0	0	3	28
Newark	1	3	0	7	18	29	0	6	0	39	115
Trenton	0	2	0	111	5	22	0	3	0	5	47
Pennsylvania											
Philadelphia	5	11	7	1,248	47	107	0	33	1	75	533
Pittsburgh	8	8	5	174	21	27	0	6	0	32	159
Reading	0	------	0	5	1	5	0	0	0	11	15
Scranton	0	------	0	0	0	6	0	0	0	16	--------
Ohio											
Cincinnati	4	------	2	76	12	31	0	8	0	28	129
Cleveland	7	50	5	65	23	174	0	15	1	161	228
Columbus	2	------	0	17	4	68	0	0	0	25	74
Toledo	2	4	3	81	10	22	0	2	0	82	90

City reports for week ended Mar 24, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Indiana											
Fort Wayne	2	------	1	16	3	16	0	1	1	1	24
Indianapolis	2	------	0	450	15	14	0	2	2	50	------
South Bend	0	------	0	0	2	7	0	0	0	0	17
Terre Haute	0	------	0	1	1	0	0	0	0	0	20
Illinois											
Chicago	6	5	9	233	61	325	0	45	0	230	758
Cicero	0	------	0	0	0	0	0	0	0	0	5
Springfield	0	3	0	266	3	1	0	0	0	14	25
Michigan											
Detroit	13	8	3	88	30	202	0	6	1	121	267
Flint	1	------	2	16	6	119	0	2	0	16	37
Grand Rapids	0	------	2	8	3	41	0	1	1	4	35
Wisconsin											
Kenosha	0	------	0	4	0	20	0	0	0	4	6
Madison	0	------	------	4	------	2	0	------	0	40	16
Milwaukee	3	1	1	9	5	129	0	2	0	160	90
Racine	1	------	0	0	0	22	4	1	0	4	11
Superior	0	------	0	0	2	1	0	0	0	0	8
Minnesota											
Duluth	0	------	0	0	2	0	0	2	0	1	19
Minneapolis	4	------	4	12	11	26	0	1	0	21	101
St Paul	0	------	0	3	3	7	0	4	0	12	64
Iowa											
Des Moines	0	------	------	1	------	5	0	------	0	0	43
Sioux City	0	------	------	22	------	0	0	------	0	4	------
Waterloo	0	------	------	0	------	0	0	------	0	23	------
Missouri											
Kansas City	4	------	2	6	8	23	0	6	0	21	119
St Joseph	1	------	0	17	6	3	0	0	0	0	19
St Louis	26	------	------	118	13	31	2	15	1	94	254
North Dakota											
Fargo	0	------	0	69	1	0	0	0	0	4	8
Grand Forks	0	------	0	0	0	0	0	0	0	0	------
South Dakota											
Aberdeen	0	------	0	1	0	0	0	0	0	1	------
Sioux Falls	0	------	0	6	0	0	0	0	0	0	8
Nebraska											
Omaha	2	------	0	134	9	6	2	2	0	12	57
Kansas											
Topeka	0	------	0	1	2	4	0	0	0	23	17
Wichita	0	------	0	14	8	0	0	1	0	22	29
Delaware											
Wilmington	0	------	0	78	7	3	0	0	0	1	30
Maryland											
Baltimore	2	9	2	793	23	38	0	8	0	225	216
Cumberland	0	------	0	1	2	3	0	0	0	8	11
Frederick	0	------	0	7	0	2	0	0	0	0	2
District of Columbia											
Washington	9	1	1	711	21	15	0	22	0	56	195
Virginia											
Lynchburg	2	------	0	1	2	3	0	0	0	2	17
Norfolk	0	4	0	124	8	2	1	2	0	2	45
Richmond	0	2	1	246	8	4	0	5	0	0	64
Roanoke	0	------	2	0	0	3	0	0	0	2	20
West Virginia											
Charleston	0	------	0	0	2	2	0	1	0	3	9
Huntington	1	------	0	0	0	23	0	0	0	0	------
Wheeling	0	------	1	7	2	26	0	0	0	9	13
North Carolina											
Raleigh	------	------	------	------	------	------	------	------	------	------	------
Wilmington	0	------	0	2	2	1	0	0	0	6	10
Winston-Salem	0	1	0	59	2	2	0	0	0	0	14
South Carolina											
Charleston	1	34	1	22	4	0	0	3	2	3	25
Columbia	0	------	0	0	0	0	0	0	0	0	0
Greenville	0	------	0	3	2	1	0	1	0	8	12
Georgia											
Atlanta	4	20	2	133	10	1	0	6	0	0	89
Brunswick	0	------	0	54	0	0	0	1	0	0	2
Savannah	0	83	1	76	3	4	0	5	0	1	45
Florida:											
Miami	1	1	0	38	0	1	0	1	0	13	17
Tampa	1	1	1	27	2	2	0	2	0	0	24
Kentucky:											
Ashland	0	------	------	15	------	1	0	------	0	6	------
Lexington	0	------	0	13	3	1	0	0	0	3	16
Louisville	1	6	0	1	10	24	0	0	0	41	82

City reports for week ended Mar 24, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Tennessee											
Memphis	3	------	1	250	18	4	0	5	4	2	104
Nashville	0	------	1	34	4	5	0	0	0	12	53
Alabama											
Birmingham	1	3	2	70	5	0	0	4	0	1	64
Mobile	1	------	3	10	3	0	0	2	0	0	30
Montgomery	2	1	------	53	------	1	0	------	0	6	------
Arkansas											
Fort Smith	0	------	------	9	------	1	0	------	0	1	------
Little Rock	1[1]	1	1	106	6	1	0	4	0	0	12
Louisiana											
New Orleans	19	5	3	47	10	24	0	10	3	0	142
Shreveport	0	------	1	10	5	3	0	2	0	2	45
Oklahoma											
Oklahoma City	3	------	0	15	17	3	2	1	0	0	50
Texas											
Dallas	5	1	1	6	11	12	0	4	0	7	75
Fort Worth	6	------	3	2	9	5	0	4	2	0	52
Galveston	4	------	0	1	3	9	0	1	0	0	13
Houston	2	------	1	1	11	3	3	11	0	0	92
San Antonio	3	------	0	7	11	1	0	12	0	0	80
Montana											
Billings	0	------	0	0	0	0	0	0	0	0	13
Great Falls	0	------	0	3	4	0	0	0	0	1	12
Helena	0	------	0	0	0	0	0	0	0	0	1
Missoula	0	------	0	1	1	0	0	0	0	3	9
Idaho											
Boise	------	------	------	------	------	------	------	------	------	------	------
Colorado											
Denver	2	49	2	106	11	12	1	4	0	89	83
Pueblo	0	------	0	21	2	3	0	0	0	38	11
New Mexico											
Albuquerque	1	1	1	10	1	0	0	5	0	1	13
Utah											
Salt Lake City	1	------	0	236	1	6	0	1	0	52	26
Nevada											
Reno	0	------	0	4	0	0	0	0	0	0	4
Washington											
Seattle	0	------	1	1	6	23	1	6	0	78	122
Spokane	0	1	1	25	6	6	1	1	0	16	40
Tacoma	0	------	0	49	2	0	0	0	0	28	20
Oregon											
Salem	0	1	0	0	0	0	0	0	0	0	------
California											
Los Angeles	22	21	2	70	23	46	0	23	0	43	315
Sacramento	0	------	0	3	6	3	0	5	0	2	38
San Francisco	6	3	0	118	3	8	0	17	4	11	159

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
New Hampshire			
Concord	0	0	1
Massachusetts			
Boston	2	1	1
New York			
New York	4	2	0
Syracuse	1	0	0
Pennsylvania			
Philadelphia	0	0	1
Ohio			
Cleveland	1	0	0
Indiana			
Indianapolis	1	0	0
Terre Haute	1	1	0
Illinois			
Chicago	11	4	0
Springfield	1	0	0
Wisconsin:			
Milwaukee	2	0	0
Minnesota			
Duluth	1	0	0

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Iowa			
Des Moines	1	0	0
Sioux City	2	2	0
Missouri			
St Joseph	1	1	0
St Louis	2	0	0
North Dakota:			
Fargo	0	1	0
Nebraska			
Omaha	1	1	0
Maryland			
Baltimore	1	0	1
Washington			
Spokane	1	0	0
California			
Los Angeles	0	2	4
Sacramento	1	0	0
San Francisco	0	1	0

Pellagra —Cases Philadelphia, 1, Baltimore, 1; Charleston, S C., 2; Atlanta, 1; Savannah, 1, Nashville, 1, Birmingham, 2, Montgomery, 1

Lethargic encephalitis —Cases New York, 2, Cleveland, 1, Detroit, 1, Houston, 1, San Francisco, 1.

[1] Nonresident.

FOREIGN AND INSULAR

AUSTRALIA

Notifiable diseases—Year 1933.—During the year 1933, cases of certain notifiable diseases were reported in the Commonwealth of Australia, as follows:

Disease	Cases	Disease	Cases
Anthrax	1	Leprosy	31
Beriberi	2	Malaria	45
Cerebrospinal meningitis	54	Measles	13,709
Chicken pox	1,055	Mumps	452
Dengue	45	Poliomyelitis	62
Diphtheria	14,825	Puerperal fever	43[illegible]
Dysentery	37	Scarlet fever	8,80[illegible]
Erysipelas	130	Tetanus	28
Filariasis	2	Tuberculosis	3,534
Hookworm disease	166	Typhoid fever	501
Hydatid	9	Typhus fever	62
Influenza	897	Whooping cough	987
Lethargic encephalitis	34		

NOTE.—The population of the Commonwealth of Australia, estimated as of June 30, 1933, was 6,630,600.

CUBA

Provinces—Notifiable diseases—5 weeks ended December 30, 1933.—During the 5 weeks ended December 30, 1933, cases of certain notifiable diseases were reported in the Provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer		1		6		1	8
Chicken pox		3		2			5
Diphtheria		7	3	8	2	2	22
Leprosy						5	5
Malaria	528	64	608	3,108	163	1,285	5,756
Measles		3	1	1			5
Scarlet fever		2		1			3
Tuberculosis	10	6	22	119	15	34	206
Typhoid fever	8	4	18	111	16	27	184

Habana—Communicable diseases—4 weeks ended March 24, 1934.—During the 4 weeks ended March 24, 1934, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	10	1	Scarlet fever	2	
Malaria	35		Tuberculosis	46	1
Measles	10		Typhoid fever	35	5

GREAT BRITAIN

England and Wales—Vital statistics—October–December 1933.—During the fourth quarter of the year 1933, 129,925 live births and 122,097 deaths were registered in England and Wales The following statistics are taken from the Quarterly Return of Births, Deaths, and Marriages, issued by the Registrar-General of England and Wales. The figures are provisional.

Birth and death rates in England and Wales, October–December 1933

Annual rates per 1,000 population	
Live births	12 80
Stillbirths	57
Deaths, all causes	12 00
Deaths from	
Diphtheria	09
Influenza	14
Measles	04
Scarlet fever	03
Annual rates per 1,000 population—Continued	
Deaths from—Continued	
Typhoid fever and paratyphoid fever	01
Violence	53
Whooping cough	03
Deaths per 1,000 live births	
Diarrhea and enteritis (under 2 years)	9 10
Deaths under 1 year	69 00

England and Wales—Infectious diseases—13 weeks ended December 30, 1933—During the 13 weeks ended December 30, 1933, cases of certain infectious diseases were reported in England and Wales, as follows.

Disease	Cases	Disease	Cases
Diphtheria	16, 654	Puerperal pyrexia	1, 368
Ophthalmia neonatorum	902	Scarlet fever	51, 653
Pneumonia	13, 132	Smallpox	46
Puerperal fever	542	Typhoid fever	419

ITALY

Communicable diseases—4 weeks ended October 15, 1933.—During the 4 weeks ended October 15, 1933, cases of certain communicable diseases were reported in Italy, as follows:

Disease	Sept 18–24		Sept 25–Oct 1		Oct 2–8		Oct 9–15	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	77	50	43	32	56	38	40	34
Cerebrospinal meningitis	9	9	5	5	4	4	3	3
Chicken pox	79	53	109	60	72	51	81	51
Diptheria and croup	487	274	453	242	534	289	604	311
Dysentery	28	21	32	21	15	10	11	10
Lethargic encephalitis	2	2	3	3	2	2	1	1
Measles	582	132	394	118	661	162	558	127
Poliomyelitis	15	14	10	9	8	8	12	9
Scarlet fever	285	132	354	156	392	184	369	186
Typhoid fever	1, 251	591	948	475	888	451	713	385

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Mar 30, 1934, pp 438-450 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Apr 27, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands.—During the week ended March 31, 1934, cholera was reported in the Philippine Islands as follows Bohol Province—Tubigon, 3 cases, 4 deaths Cebu Province—Pinamungajan, 1 case, 1 death Occidental Negros Province—Escalante, 6 cases, 5 deaths; San Carlos, 6 cases, 6 deaths Oriental Negros Province—Guijanangan, 1 case, 1 death

Plague

Portuguese India—Colem—During the week ended February 3, 1934, 2 cases of plague with 2 deaths were reported in Colem, Portuguese India.

Smallpox

Eritrea—Asmara.—During the week ended March 17, 1934, one imported case of smallpox was reported in Asmara, Eritrea

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 16

APRIL 20 - - - - 1934

IN THIS ISSUE

Review of the Etiology and Incidence of Heart Disease
Annual Physical Examination Study at a Penitentiary
Deaths in Large Cities During the Week Ended March 31
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON. 1934

r sale by the Superintendent of Documents, Washington, D C - - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

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It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health

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CONTENTS

	Page
Heart disease—A brief review of the etiology and incidence, and possibilities of preventing the disease, especially the rheumatic type	497
Annual physical examination study at the Atlanta Federal penitentiary	508
Court decision on public health	510
Public Health Service publications—A list of publications issued during the period July–December 1933	512
Deaths during week ended March 31, 1934	
Deaths and death rates for a group of large cities in the United States	514
Death claims reported by insurance companies	514
PREVALENCE OF DISEASE	
United States	
Current weekly State reports	
Reports for weeks ended April 7, 1934, and April 8, 1933	515
Summary of monthly reports from States	517
Epidemic of typhoid fever in Augusta, Maine	518
Plague-infected ground squirrels, Kern and Tulare Counties, Calif	518
Weekly reports from cities	
City reports for week ended March 31, 1934	519
Foreign and insular	
Canada.	
Provinces—Communicable diseases—2 weeks ended March 24, 1934	522
Quebec Province—Communicable diseases—2 weeks ended March 24, 1934	522
Montreal—Amoebic dysentery	522
Cuba—Provinces—Notifiable diseases—4 weeks ended January 27, 1934	523
Czechoslovakia—Communicable diseases—January 1934	523
Jamaica—Communicable diseases—4 weeks ended March 24, 1934	523
Cholera, plague, smallpox, typhus fever, and yellow fever:	
Cholera	524
Plague	524

PUBLIC HEALTH REPORTS

VOL. 49 APRIL 20, 1934 No. 16

HEART DISEASE

A Brief Review of the Etiology and Incidence, and Possibilities of Preventing the Disease, Especially the Rheumatic Type

By ROBERT OLESEN, *Medical Director, United States Public Health Service*

Because it is a frequent cause of disability and death, heart disease is receiving a steadily increasing amount of attention looking to its possible curtailment. Some observers contend that, in addition to being the leading cause of death in the United States, heart disease is increasing in frequency. Others point out that the conception of increased mortality is based upon faulty premises. In any event there is common agreement that the number of deaths from the combination known as cardio-vascular-renal disease has reached sufficient magnitude to demand intensive study and concerted combative measures, at least insofar as such efforts may be practicable

In order that the importance of preventing heart disease may be better comprehended, it is desirable that the extent of the problem be realized. While epidemiological and statistical studies are steadily adding to our knowledge of the conditions under which heart disease occurs, the prevention of the affection is undoubtedly much more complicated than the control of such communicable diseases as tuberculosis, diphtheria, and the like. Nevertheless it is the hope that, as additional information becomes available, effective methods may be found of forestalling some of the suffering and premature death from this relatively obscure malady, particularly among young persons.

Heart disease mortality in the United States.—In presenting a brief statistical summary of heart disease mortality it should be understood that much of the data is inadequate and at times even faulty. However, the figures which have been collected by various observers aid greatly in appreciating the extent and ramifications of this complicated problem. If the deaths registered as being due to heart disease are considered, there can be no doubt that the mortality has increased steadily in the United States. The salient features of heart disease mortality have been interestingly emphasized in a series of tables and charts prepared by Whitney for the American Heart Association.[1]

The increase in heart disease mortality is shown in table 1, in which are presented the annual death rates per 100,000 population in the United States registration area from 1911 to 1930, both from

[1] Jessamine S. Whitney: Heart disease mortality statistics (United States registration area) American Heart Association, May 1927.

Other Diseases of the Heart (Census classification no. 90, alone) and from Circulatory Diseases Combined (Census classification nos 87–90, inclusive). The same information is displayed graphically in chart 1 Many observers prefer to consider only the mortality due to Other Diseases of the Heart, contending that deaths from pericarditis, endocarditis, myocarditis, and angina pectoris should be examined apart. Census classification no 90 includes approximately 89 percent of all deaths included in the general classification of heart disease However, whether the one or the other classification is used

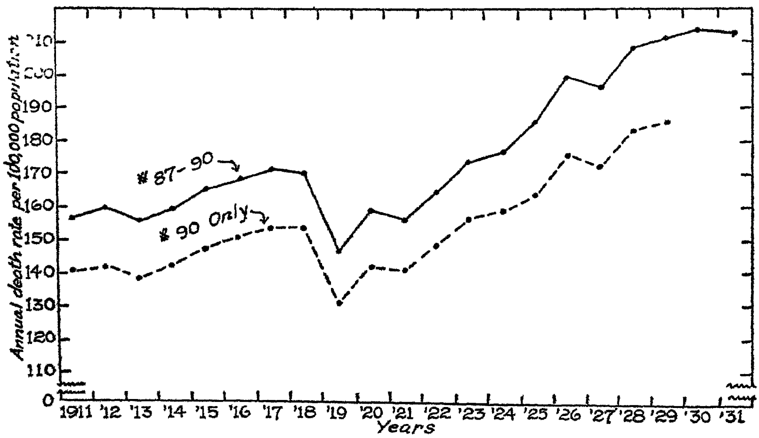

CHART 1 —Annual death rate per 100,000 population from "Other diseases of the heart" (Census classification no 90, alone) and from "Circulatory diseases" combined (Census classification nos 87–90, inclusive) in the United States expanding registration area, from 1911 to 1931

for statistical purposes the similarity in trend and the steady increase in mortality rates are unmistakable.

TABLE 1 —*Annual death rates per 100,000 population from Other Diseases of the Heart (Census classification no. 90, alone) and from Circulatory Diseases combined (Census classification nos 87–90, inclusive) in the United States expanding registration area, from 1911 to 1931*

Year	Death rates per 100,000 population: Other diseases of the heart (census classification no. 90)	Death rates per 100,000 population: Circulatory diseases combined (census classification nos. 87-90)	Year	Death rates per 100,000 population: Other diseases of the heart (census classification no 90)	Death rates per 100,000 population: Circulatory diseases combined (census classification nos 87-90)
1911	140.9	157 1	1922	148 4	164 6
1912	142.6	159 9	1923	157 3	173 8
1913	138.6	155 8	1924	159 1	176 5
1914	141 9	159 7	1925	163 6	195 7
1915	147 6	165 7	1920	175 8	199 5
1916	150.7	168.7	1927	171 9	196.0
1917	153.8	171 7	1928	183 2	208 2
1918	153.4	170 1	1929	185 5	210.8
1919	131.0	146.7	1930		213.5
1920	141 9	159 1	1931		212.5
1921	140.9	156.3			

In 1900, when comparable annual mortality figures for the United States became available, the death rate for heart disease was 111.2 per 100,000 population. Following a continuous rise during the next 10 years the death rate from this disease reached 141 5 per 100,000 population in 1910 During the next decade there were marked fluctuations in the annual death rates While fairly uniform at first, the rates reached high points in 1917 and 1918, exceeding 153.0 deaths per 100,000 Then followed, in 1919, 1920, and 1921, comparatively low rates, due in all probability to the fact that an excessive number of sufferers from heart disease expired during the influenza epidemic. Since 1922 the heart disease death rate has been rising steadily, year by year, exceeding at times the high rates preceding the influenza period. However, it may be that these rates, while indicating the mortality trends from deaths registered as having been due to heart disease, do not give a satisfactory picture. Owing to changes in United States census disease classifications, fads in medical diagnosis, and shifts of diagnosis from one category to another, it is likely that many of the deaths registered as being due to heart disease were properly chargeable to other conditions

Heart disease mortality in New York City not increasing.—The Bolduans [2] have recently pointed out that heart disease is rarely a single entity and that statistics based on registered deaths from this disease alone are fallacious. They insist that deaths from apoplexy, arterial disease, and senility also be taken into account. While admitting the importance of heart disease as a public health problem, they regard it as merely a portion of a much larger question, namely, the prevention of the symptom complex which they term "cardio-arterio-renal" disease. So far as New York City is concerned, the Bolduans fail to find any evidence of an increase in the real death rates from heart disease. Even in the higher age groups the specific death rates have declined since the beginning of the century. The suggested statistical procedure might with advantage be applied in other communities, lest a single phase rather than the complicated whole problem receive undue emphasis.

However, when the United States registration area as a whole is considered, the successive addition of mortality rates of cerebral hemorrhage, acute heart disease, arterial diseases, nephritis, and senility (plotting on a semilogarithmic scale according to the procedure outlined by the Bolduans) to those of chronic heart disease shows that the combined death rates are steadily and markedly increasing. Moreover, to "other diseases of the heart" (census classification no. 90) may be ascribed the principal cause of the increased mortality.

[2] C. F. Bolduan and N. W. Bolduan: Is the appalling increase in heart disease real? Jour. Preventive Med., 6:4, 321, July 1932.

Geographical variations in heart disease mortality.—Of the numerous studies that have been made of the mortality from heart disease in various parts of the world, a few may be cited to show the lack of uniform distribution Thus, in Japan the rate is low In Germany, the death rate from heart disease in 1923, 175 per 100,000, was approximately the same as that in the United States The mortality rates are usually higher in cities than in either rural sections or the United States registration area as a whole. The same observation applies to Berlin and London in respect to Germany and England, respectively. In England and Wales the mortality from heart disease is said by Young [3] to be higher in counties near the sea The New York City death rate is not far removed from the median However, Berlin, London, and New Orleans, all show higher rates

In the United States, the Southern and Mountain States have distinctly lower rates than do the Pacific, New England, and Middle Atlantic States Viko [4] has pointed out that the heart disease mortality rates in Utah, Idaho, and Wyoming are relatively low when compared with other States The instances cited evidence the wide geographical variations in heart disease mortality.

Incidence of heart disease as disclosed by surveys—The extent to which heart disease is present in certain localities and groups of population has been determined to some extent by special surveys. Thus, among 2,510,791 men examined in the United States draft of 1918 there were 85,143 men with valvular disease of the heart, a rate of 33.9 per 1,000. Among recruits in New York who were examined for service in the United States Army during 1926, heart disease prevailed to the extent of 15 per 1,000. Rejections of applicants for life insurance because of this malady are reported as ranging between 20 and 24.4 per 1,000. Approximately 20 cases of heart disease were found among each 1,000 industrial workers and food handlers in New York City Among newsboys the heart disease incidence was 15 per 1,000. Surveys among the school children of New York City, Boston, and Cincinnati showed an average of 1 percent with heart disease. However, a survey of 17,974 school children in Florida, Illinois, and Missouri by the United States Public Health Service disclosed 3 percent with the disease.[5] In the British Isles heart disease appears to be markedly more frequent among people engaged in industrial pursuits than among agriculturists.[6] Apparently such a sharp distinction does not exist in the United States, though it is known that heart

[3] M Young: The geographical distribution of heart disease in England and Wales, and its relation to that of acute rheumatism Lancet, ii, 590, 1925

[4] L. E. Viko: Heart disease in the Rocky Mountain region Am. Heart Jour., 6 2, p 264, December 1930.

[5] Taliaferro Clark: Heart disease a public health problem Pub. Health Rep, 44-41, p. 2463, Oct. 11, 1929.

[6] The problem of rheumatic fever in children. Report of a special committee of the British Medical Association. British Med Jour, 2 p 23, July 3, 1926.

disease is more frequently encountered in the northern than in the southern portion of the country. While many of the differences cited appear to be quite definite, it should be remembered that the examinations and estimates were made by many physicians possessing varying degrees of experience and skill in diagnosing cardiac abnormalities

DePorte [7] estimates that there are 300,000 cases of heart disease in New York State alone. This estimate is based upon the reports of 98,069 noncommunicable illnesses voluntarily made by physicians in New York Among these illnesses 4 percent were ascribed to heart disease From a consideration of the available morbidity statistics, Cohn [8] believes that approximately 20 of each 1,000 adults in the United States have heart disease. The morbidity rate is probably

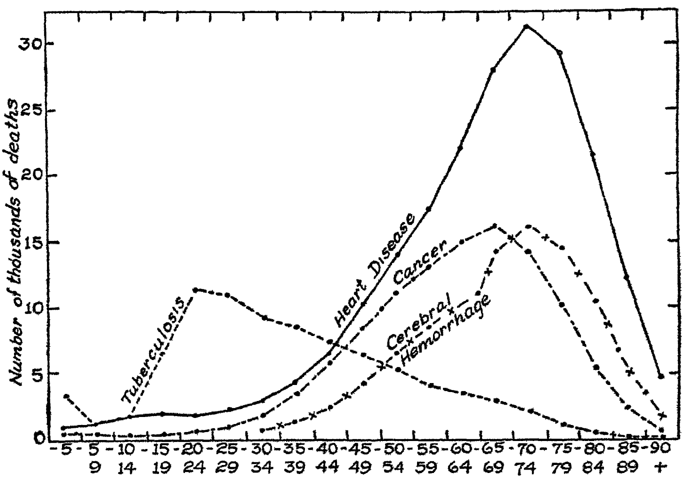

CHART 2.—Number of deaths, by age groups, from cancer, cerebral hemorrhage, heart disease, and tuberculosis, in the United States registration States (including District of Columbia) for the year 1929.

100 times as great as the mortality. The number of heart disease sufferers in the United States is often placed at 2,000,000, but Cohn feels that this is too high and suggests 682,500 as more nearly correct.

Deaths from heart disease are more likely to occur in the older age groups This fact is shown in table 2, which also indicates the number of deaths, by age groups, in the registration States, from cancer, cerebral hemorrhage, and tuberculosis during the year 1929. These data are presented graphically in chart 2. Whereas the peak number of deaths from tuberculosis occurs in the age group 20 to 24 years, that of cancer is seen at 65 to 69 years, and the peak numbers in

[7] J. V. DePorte Heart disease in the State of New York, A statistical review of mortality and morbidity. Am. Heart Jour., 5 5, p 652, June 1930

[8] Alfred E Cohn: Heart disease from the point of view of the public health. Am. Heart Jour., 2. 3, p. 275, February 1927.

cerebral hemorrhage and heart disease deaths occur at 70 to 74. It will be noted that the numbers of deaths from cancer, cerebral hemorrhage, and tuberculosis are notably fewer than are those from heart disease

TABLE 2.—*Number of deaths, by age groups, from cancer, cerebral hemorrhage, heart disease, and tuberculosis, in the registration States (including the District of Columbia) during the year 1929*

Disease	Under 5	5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Cancer and other malignant tumors, nos 43-49	385	206	235	390	538	974	1,827	3,488	5,801	8,330
Cerebral hemorrhage, nos 74a and 74b	261	104	93	170	272	397	654	1,357	2,584	4,346
Other diseases of the heart, no 90	838	919	1,452	1,697	1,835	2,264	2,974	4,476	6,526	10,345
Tuberculosis (all forms)	3,392	1,226	1,529	6,464	11,335	10,872	9,132	8,493	7,353	6,399

Disease	50-54	55-59	60-64	65-59	70-74	75-79	80-84	85-89	90 and over
Cancer and other malignant tumors, nos 43-49	11,139	13,062	14,900	15,920	14,349	10,148	5,565	2,427	673
Cerebral hemorrhage, nos 74a and 74b	6,562	8,518	11,103	14,241	15,872	14,548	10,486	5,034	1,769
Other diseases of the heart, no 90	14,060	17,373	22,664	27,980	31,314	29,126	21,374	12,101	4,780
Tuberculosis (all forms)	5,404	4,338	3,539	2,973	2,162	1,328	528	171	45

In analyzing 20,000 deaths from heart disease, Dublin[9] found 8 percent under 25 years of age and 17 percent under 49 years After the age of 40 the death rate for heart diseases rises precipitously, 68 percent of all deaths from that disease occurring before the age of 65. Regarding sex, Dublin found the death rates among white males and females about the same until the age of 35. Thereafter the rate was higher among white males. Among colored people the death rates were higher at every age than among the whites and especially higher among the colored females.

Comparison of heart disease with certain other maladies—Heart disease differs from tuberculosis and other diseases of bacterial origin in that it is not due to a single cause. Thus the malady may be the result of rheumatic infection, syphilis, arterial degeneration, or renal disease. However, it is likely that arterial decay and cardiac degeneration are not definite diseases but rather an accompaniment of the aging process. Therefore, it may be necessary to make a distinction between the decrepitude of old age, which is a normal and natural biological process, and the diseases of old age About two fifths of all deaths from heart disease occur after the age of 70, when little can be done except to follow the rules governing the hygiene of old age.

When graphs depicting the annual death rates from infectious diseases are contrasted with those from heart disease it is seen that

[9] Louis I. Dublin: Statistical aspects of the problem of organic heart disease Am Heart Jour., 1: 3, p. 260, February 1926.

they move in opposite directions, the former having fallen while the latter have risen with age However, the curves are not uniformly smooth, for at times changes in direction have occurred After the infectious disease curve begins to fall, there is a marked delay before the heart disease mortality curve begins to rise The delayed rise may be explained by the fact that persons who escaped death from communicable disease later became victims of another malady, heart disease The increased death rate from diseases of the heart after the age of 40 supports this view

During the 20-year period from 1900 to 1920 the death rates from pulmonary tuberculosis fell steadily while those from heart disease rose The pneumonia death rate has not approached that of heart disease since 1910. Cohn maintains that, while the cancer death rate is increasing, the control of this disease is a relatively small problem compared with that of reducing heart disease mortality.

Causes of heart disease —It has already been pointed out that heart disease, unlike affections due to a single, definite, and specific organism, is really a complex condition resulting from any one of a variety of causes. The term heart disease is, therefore, unfortunate in that it fails to indicate the exact underlying cause, extent of structural damage, functional condition of the heart, or the degree of disability occasioned the sufferer. The American Heart Association [10] has endeavored to supply this deficiency through a standard nomenclature. By means of appropriate terms it is now possible to describe more accurately a given case of heart disease and it is desirable that this be done uniformly and generally.

According to cause, between 85 and 90 percent of all cases of heart disease may be classified under 3 or 4 principal headings and in varying proportions, according to geographical location and population composition. In a group of 600 hospital patients with heart disease, Cabot [11] found that 93 percent fell in 4 principal classes, namely, rheumatic, 40.6 percent; syphilis, 12 3 percent; arteriosclerosis, 15.5 percent; and nephritis (often included by other observers under the preceding heading), 19.5 percent. This differentiation, made in 1914, marked a distinct advance in the classification of heart disease by causes. Dublin gives the etiology of 1,000 cases of heart disease as follows: Rheumatic fever, 25 percent; arteriosclerosis, 40 percent; syphilis, 10 percent; and unknown causes, about 10 percent.

According to the sections of the country from which reports are made, there are notable differences in the percentages of heart disease

[10] Criteria for the classification and diagnosis of heart disease, by the Criteria Committee of the Heart Committee of the New York Tuberculosis and Health Association, Inc., approved by the American Heart Association, 1932.

[11] R. C. Cabot: The four common types of heart disease. Jour Am Med. Assoc, 63. 1461, Oct 24, 1914.

due to various causes. In the Pacific Northwest, for instance, Coffen[12] reports that hypertensive cardiovascular heart disease is the most frequent, amounting to 56 percent. Rheumatic heart disease, in his experience, shows a low incidence, 0 1 to 5 8 percent, while goiter causes a relatively high cardiovascular incidence, 6 1 percent

In Washington, D C, Gager and Dunn[13] have presented the etiological factors in 1,200 cases of heart disease, equally divided between white and colored patients The findings are shown in table 3.

TABLE 3 —*The causes of heart disease and percentages of each cause among 600 white and 600 colored patients in Washington, D C*

Cause	Percent among 600 white patients	Percent among 600 colored patients
Rheumatism	7 2	4 2
Syphilis	4 3	15 5
Thyroid	3 7	1 3
Hypertension	51 3	59 2
Arteriosclerosis	26 0	13.0
Endocarditis	5 7	5.2

The minor causes of heart disease, amounting to 10 or 15 percent of the aggregate, may be stated as follows:

1. Congenital defects and malformations.
2. Thyroid disease.
3. Acute infections, such as diphtheria.
4. Cardiac neuroses
5. Trauma.
6 Undetermined causes.

In most of the statistics presented, it will be noted that rheumatic fever looms fairly large as a cause of heart disease Moreover, this condition which, according to many observers, is a communicable affection and very similar in its behavior to well-known epidemic diseases, may be amenable to suitable control measures. Therefore, it is desirable that some of the outstanding features of rheumatic fever be considered.

Salient points concerning rheumatic fever.—In the absence of definite knowledge as to the character of the causative agent in rheumatic fever it is natural that many possible factors should be considered. Very significant is the possible relationship of rheumatic fever to the family of streptococcal infections. This resemblence is accentuated by bacteriological likenesses and clinical and epidemiological similar-

[12] T. Homer Coffen: Incidence of heart disease in the Pacific Northwest Am Heart Jour, 5. 1, p 99, October 1929

[13] Leslie T. Gager and W. L. Dunn: The etiological factors in 1,200 cases of heart disease in Washington, D.C. A study of etiological types and the factors of race, age, and sex. Medical Annals of the District of Columbia, 2: 5, p. 112, May 1933.

ities. When rheumatic fever is compared with scarlet fever, chorea, erysipelas, septicemia, and puerperal fever, the annual fluctuations in incidence are quite similar Hirsch[14] believes that "it deserves an assumed place among the acute infectious diseases."

While a streptococcus may be the immediate exciting cause of rheumatic fever, it is usually difficult to demonstrate the presence of such an organism. Consequently the strong suspicion must persist that certain predisposing factors play a large part in the causation of this disease Rheumatic fever is essentially a disease of people in unfavorable economic circumstances. Insufficient food or food lacking in essentials may play a prominent part in producing the disease. It has been suggested that rheumatic fever may be a successor of rickets, which latter affection is due to an insufficient ingestion of vitamin D, and specifically to a lack of calcium

Epidemiological studies have afforded considerable aid in understanding the peculiarities of rheumatic fever Swift estimates the average rheumatic fever attack rate in the United States as 1 67, in contrast to 1 98 in Norway, 1 32 in England, and 1 45 in Germany According to this calculation there are probably 175,000 cases of rheumatic fever in the United States In German and Scandinavian hospitals between 2 and 5.5 percent of all admissions are due to rheumatic fever, with the proportion higher in the more northerly cities. In England between 7 and 11 5 percent of all hospital patients have rheumatic fever The disease is rare in Arabia as compared with Southern Europe. In the United States rheumatic fever is more common in Boston than in New Orleans, Galveston, Oklahoma City, or Richmond. Occupying intermediate positions are Baltimore and St. Louis

Rheumatic fever is preeminently a disease of childhood, the maximum incidence of the disease being reached before the age of 10 years. In a group of 500 children studied by Wilson, Lingg, and Croxford[15] it was found that the average age of onset of rheumatic infection was 7.3 years. In one half of those affected the onset occurred between the ages of 6 and 9 years. About the age of 12 the tendency to infection begins to diminish According to these observers, the earlier the age of onset the greater is the number of recurrences within 1 year. During childhood rheumatic fever is more frequent among females.

There are certain facts concerning rheumatic fever which appear to be quite well established. Thus, the disease has a somewhat limited geographical distribution, being less frequent in the Tropics

[14] August Hirsh Handbook of geographical and historical pathology (Translated by C. Creighton, London, 1886).

[15] Wilson, Lingg, and Croxford· Tonsillectomy in its relation to the prevention of heart disease Part IV. Statistical studies bearing on problems in the classification of heart disease. Am Heart Jour, 4, 2, p. 197, December 1928.

but finding more favorable conditions for its propagation in temperate climates. More acute attacks of this disease occur in colder and wetter months However, the period of maximum incidence varies according to locality

There are considerable data which indicate that the incidence of rheumatic fever is higher in certain races, as for instance, the Italians and Irish. However, these conclusions are open to the criticism that environmental and hereditary influences have not received sufficient consideration in this connection.

From the evidence produced by a number of observers it is justifiable to conclude that rheumatic fever is likely to be transmitted within families. Thus, St. Lawrence[16] records 200 instances of rheumatic fever in 50 families in which 480 persons were exposed. Of the latter number, 14.8 percent became ill with the same disease, a higher incidence than when tuberculosis contact is involved. Moreover, families of rheumatic fever patients are twice as likely to have another member of the family infected with the disease as families free from the disease. According to Cohn, between 8 and 10 percent of persons exposed to rheumatic fever in families acquire the disease, as against 1 or 2 percent in the population at large, and 2.95 percent in families of healthy controls.

Duration of rheumatic heart disease.—Because of the economic aspects of heart disease, as well as the suffering and incapacity occasioned by the illness, efforts have been made to determine the duration of an average case of rheumatic fever. By studying the progress of the disease from the beginning of infection to the death of many individuals it has been estimated that the average duration of the disease is about 17 years. Thus, from the onset of the rheumatic infection to the establishment of a chronic valvular disease from 1 to 8 years elapses, 4 years being the average. In about 7 years the stage of cardiac decompensation or failure sets in. From this point until death there is an average interval of about 4 years.

Sanatorium treatment for rheumatic fever patients.—Because of its chronicity and its similarity in many respects to tuberculosis, syphilis, and other infections, a number of convalescent homes have been established for the care of children suffering from rheumatic fever. There is evidence to show that numerous benefits accrue to the patients in these homes. It is claimed that the number of relapses among such patients are fewer than among children treated in their own homes. Other observers contend that flareups of rheumatic fever are more frequent when such patients are discharged to their own homes. Apparently sanatorium care is definitely helpful but unfortunately cannot reach sufficient numbers of the afflicted or be

[16] W. St. Lawrence: The family association of cardiac disease, acute rheumatic fever and chorea: A study of 100 families Jour Am. Med. Assoc., 79; p. 2051. 1922.

continued for sufficient periods to cope with more than a fraction of those who have the disease In order to evaluate the sanatorium treatment of rheumatic fever a careful comparison of the results must be made with a control group which has not had the advantage of such care.

The effect of residence in a subtropical climate upon patients having rheumatic fever has been tested by Coburn [17] in Puerto Rico and by Jones [18] in Florida. Groups of children suffering from rheumatic fever were transferred from New York and Boston to the places mentioned Marked amelioration of symptoms accompanied the transfers, but relapses were frequent upon returning to the original environment As such experiments can be applied only upon a limited scale, they are so far of interest chiefly as indications of marked climatic and geographical influences upon the rheumatic state The benefits accruing from a change of location suggest, of course, the desirability of transferring such patients to the favorable localities whenever practicable.

Economic aspects of heart disease in general.—In addition to the suffering and premature death caused by heart disease, it is important that the economic aspects of the condition receive consideration. After studying the cost of hospital care, nursing visits, clinic care, convalescent care, and sickness costs, Emerson [19] estimates that the care and treatment of heart disease patients in the United States costs approximately $0 75 per capita per annum Furthermore, he points out that the burden incident to the presence of heart disease falls most heavily upon the unskilled wage earner, persons of the lower economic class. This burden increases with each decade of life between the ages of 25 and 65.

Can heart disease be prevented?—As the incidence of heart disease varies somewhat in different sections of the United States, the problems of prevention are not identical Theoretically, at least, several of the conditions responsible for heart disease are subject to public health control. Practically, however, the institution of effective control measures is fraught with much difficulty and discouragement. Taking syphilitic heart disease as an example, it is obvious that the elimination of syphilitic infection would result in the disappearance of heart disease due to this cause However, despite intensive educational and other combative efforts, reduction in the number of syphilitic individuals has been comparatively slight. Nor does the control of heart disease due to the senescent or aging process hold forth much promise. However, observance of the rules of personal

[17] Alvin F Coburn The factor of infection in the rheumatic state Williams and Wilkins Company, Baltimore

[18] T. Duckett Jones and Edward F Bland· The course and prognosis of rheumatic fever and chorea (Read before the Ninth Scientific Session of the American Heart Association, Milwaukee, June 13, 1933)

[19] Haven Emerson. Economic aspects of heart disease Am. Heart Jour., 4; 3, p 251, February 1929.

hygiene will do much in delaying the onset of senescence, adding to comfort and prolonging life when old age comes. As Cohn [20] has well said, "That the rate of so-called heart disease is high and is constantly mounting, is a condition in which those may take satisfaction who believe increased length of life for more persons is one of the great blessings of man. The rise may be alarming but it is not malign."

Inasmuch as studies so far conducted indicate that rheumatic fever is due to an infective agent, probably of streptococcal origin, aided and abetted by faulty environmental or dietary factors, it may be that by closing the avenues of infection it will be possible to prevent damage to the heart from this cause and subsequent physical impairment. It is for this reason that many exponents of preventive medicine have concentrated their efforts against heart disease by attempting the control of rheumatic fever.

Continued statistical, epidemiological, and clinical studies are required for the solution of the puzzling features associated with various types of heart disease. When adequate information has been assembled, it may be possible to concentrate preventive and ameliorative activities upon such forms of the disease as will show an encouraging response to combative effort.

ANNUAL PHYSICAL EXAMINATION STUDY AT THE ATLANTA FEDERAL PENITENTIARY

By W. F. Ossenfort, *Passed Assistant Surgeon, United States Public Health Service*

An annual physical examination given with a view to the discovery of some disease in its early stages is based upon sound principles. In recent years the medical profession has made some effort in this direction by means of an educational program. The effectiveness of this propaganda as applied to a heterogeneous group has not been determined. In an effort to determine the results of a program of annual examinations in such a group, an experiment has been conducted at the United States Penitentiary in Atlanta, Ga.

On September 30, 1933, the prison population was 2,125. To conduct a reasonably thorough examination of the whole group was considered as demanding a disproportionately large amount of time and would mean a considerable amount of useless repetition in that a large portion of the population had received an examination on entrance within the preceding year, another equally large portion would receive examination on discharge within the coming year, and another group

[20] Alfred E. Cohn: Heart disease from the point of view of the public health. Am. Heart Jour., 2: 4, p. 386, April 1927.

had been examined as a consequence of in-patient and out-patient treatment within the past six months The remainder of the population represented the well group, on which there was no current medical data Effort was concentrated upon this group of 424 men with a view to determine, first, their reaction toward annual examination and, second, the presence of a nonsymptomatic disease.

METHOD AND RESULTS

The men were called to the hospital in groups of 20 or more The value of an annual check-up was explained to each group by various staff members and fellow prisoners Examination was made optional, with the further explanation that each man was to make his own decision without prejudice being brought to bear for or against him The examination consisted of the usual physical examination with subject stripped, and laboratory examinations of urine, blood smear, and hemoglobin

Of the 424 men called, 112 accepted examination and 312 declined. Examination of the 112 men revealed no major physical defects other than three cases of moderate nonsymptomatic arterial hypertension which had developed since entrance to the penitentiary. Blood pressures in these three cases were 190/125, 190/95, and 180/98.

Dental examination revealed only a negligible amount of oral sepsis, with general condition of mouth and teeth very good as compared with conditions usually found on entrance to the prison.

Laboratory examination of urine revealed no case of albumin, sugar, casts, or pus

Blood smears were normal.

Hemoglobin determination by the Tallquist method showed two instances of 75 percent, 9 of 80 percent, 45 of 90 percent, 19 of 95 percent, and 12 of 100 percent.

COMMENT

The outstanding feature of this experiment was the attitude of indifference on the part of the prisoners toward an annual examination. This attitude was probably due to an inertia present prior to incarceration.

When 75 percent of individuals decline an annual examination offered to them without cost and without regard to time lost from duty, it would appear that an educational program has thus far not achieved results. Obviously the population must be appealed to either in a more persistent manner or from an entirely different standpoint. When we consider the large percentage of people that will harbor symptoms for a long period of time before consulting a physician, we can understand the reluctance to a check-up when no symptoms are present. A part of this may be due to the activities of quacks

and other factors, so that the patient feels that he cannot afford to take a chance on a doctor bill until he is driven to do so by pain, discomfort, or disability.

The medical situation in the penitentiary differs from that in the civilian population. Immediately following admission to the institution, the prisoner is given a complete physical and mental examination At the same time he is advised to take such treatment as is indicated by the findings at the examination The medical set-up consists of a well-equipped hospital and an out-patient department so located that it may be reached at any time during the day or night. The prisoner receives this out-patient care and hospitalization without cost to him. To be absent from duty is a personal advantage to him. Under such a system one would expect a request for medical care for any and all symptoms of disease. This, in fact, has been the experience at this station

The search for nonsymptomatic disease was essentially fruitless in the group of 112 examined. One might conclude, then, that an annual examination of a group in which medical care is furnished without personal disadvantage to the patient is of little or no benefit from a public health standpoint It would seem that an educational program designed to discover disease in its early stages would achieve better results if emphasis were placed upon an examination as soon as a symptom presented itself rather than upon the advisability of a periodic examination in the absence thereof. To emphasize the latter meets with too much inertia to make it of practical usefulness.

COURT DECISION ON PUBLIC HEALTH [1]

Typhoid fever carrier, experiencing difficulty in earning a living, held not entitled to benefits under insurance policy as for total and permanent physical disability.—(New York Supreme Court, Appellate Division; *Gates* v. *The Prudential Insurance Company of America*, decided Mar. 14, 1934.) The defendant insurance company issued to the plaintiff a policy of insurance which contained the following provision:

> If the insured shall become totally and permanently disabled, either physically or mentally, from any cause whatsoever, to such an extent that he (or she) is rendered wholly, continuously and permanently unable to engage in any occupation or perform any work for any kind of compensation of financial value during the remainder of his (or her) lifetime, and if such disability shall occur at any time after the payment of the first premium on this policy, while this policy is in full force and effect and the insured is less than 60 years of age, and before any nonforfeiture provision shall become operative, the company, upon receipt of due proof of such disability, will grant the following benefits:

[1] This abstract was prepared from a typewritten copy of the decision furnished by the New York State Department of Health.

Then there followed a provision for the payment to the insured of a monthly income While the policy was in full force and prior to the plaintiff's reaching 60 and before any nonforfeiture provision became operative, the State health commissioner declared the plaintiff to be a typhoid fever carrier and permanently quarantined him from all connection with the production or sale of milk or any food product and excluded him from his own farm and required him to live elsewhere. Under statutory authority the State public health council had adopted regulations placing restrictions upon typhoid carriers

In an action to recover benefits under the above-mentioned provisions of the policy the complaint alleged that the plaintiff had been forbidden to enter his own property on penalty of having his milk shut out from its only market and that, by reason thereof, he was unable to pursue his vocation of farming, either upon his own farm or as an employee elsewhere It was further alleged that, for upwards of 3 years, the plaintiff had made diligent efforts to obtain employment in the limited fields from which he had not been officially excluded but had been unsuccessful because his condition was "such as to cause people to shun and fear him." The trial court dismissed the complaint upon the ground that it failed to state facts sufficient to constitute a cause of action, and an appeal was taken

The appellate court stated that, for the purpose of the appeal, it must be assumed that the plaintiff's condition as a typhoid carrier was permanent and incurable and that he had not unreasonably refused a corrective or curative surgical operation In describing a typhoid carrier the court said

> A carrier does not have typhoid fever, he is not ill, he simply harbors typhoid bacilli and excretes them; his strength is not impaired; his constitution is in no way weakened or undermined, he has the same capacity for labor which he always had; his mental powers are not affected, he suffers no pain or impairment; he would never know that he was a carrier if fecal or urine specimens were not submitted for laboratory examination and test. * * *

With regard to the plaintiff, the opinion stated that he would still be doing his former tasks had the authorities failed to discover his condition. "His inability to get work is not due to any physical impairment, but to the edict of the State, or to fear of infection on the part of others." It was pointed out that the plaintiff had conceded in his brief that "the carrier state in and of itself, if the carrier's duty to the public and the law of the State be disregarded, would not prevent him from milking cows and handling milk." "Physically", said the court, "he is fully able to continue the manual tasks associated with the dairy business." The conclusion reached was that the judgment of the court below should be affirmed, the opinion closing as follows:

> In view of the fact that plaintiff's bodily strength has not been impaired and his ability to work has not been interfered with, it cannot, in our opinion, be

said that he is physically disabled within the meaning of the policy. He is prevented from doing certain work solely by the edict of the State A man found guilty of a crime and sent to a penal institution might be unable to find work, but such inability could not be attributed to an absence of physical power to work. Plaintiff's disability is due to the statutes of this State Statutory or legal disability is not covered by the policy When public good with regard to the safety of others steps in and puts a limitation upon his activities, the disability resulting is social in its nature rather than physical Plaintiff confuses the result with the cause The result is that he has experienced some inability to earn a livelihood, but the cause is not physical impairment of his body.

PUBLIC HEALTH SERVICE PUBLICATIONS

A List of Publications Issued During the Period July–December 1933

There is printed herewith a list of publications of the United States Public Health Service issued during the period July–December 1933.

The most important articles that appear each week in the PUBLIC HEALTH REPORTS are reprinted in pamphlet form, making possible a wider and more economical distribution of information that is of especial value and interest to public-health workers and the general public.

All of the publications listed below except those marked with an asterisk (*) are available for free distribution and as long as the supply lasts may be obtained by addressing the Surgeon General, United States Public Health Service, Washington, D C. Those publications marked with an asterisk are not available for free distribution but, unless stated to be "out of print", may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C., *at the prices noted.* (No remittances should be sent to the Public Health Service.)

Periodicals

Public Health Reports (weekly), July–December, vol. 48, nos. 27–52, pages 787 to 1583

Venereal Disease Information (monthly), July–December, vol XIV, nos 7–12, pages 141 to 322. (Annual index I to VIII in December issue)

Reprints from the Public Health Reports

1583. Rocky Mountain spotted fever: Susceptibility of the dog and sheep to the virus. By L. F. Badger. July 7, 1933. 5 pages

1584. An outbreak of dermatitis among workers in a rubber manufacturing plant. By Louis Schwartz and Louis Tulipan. July 14, 1933 6 pages.

1585. Whole-time county health officers, 1933. July 14, 1933. 9 pages.

1586. Dermatitis from chemicals used in removing velvet pile. By Louis Schwartz and Louis Tulipan. July 28, 1933 4 pages.

1587. The injection of mosquito sporozoites in malaria therapy. By Bruce Mayne. August 4, 1933. 7 pages.

1588 Physical impairment and weight. A study of medical examination records of 3,037 men markedly under or over weight for height and age. By Rollo H. Britten. August 4, 1933. 19 pages.

1589 Zinc in relation to general and industrial hygiene By Cecil K Drinker and Lawrence T Fairhall August 11, 1933 7 pages
1590 Relation of arsenoxide content to toxicity of fresh and old samples of arsphenamine New chemical tests upon the arsphenamines By Sanford M Rosenthal and T F Probey August 11, 1933 8 pages
1591 Variations of growth in weight of elementary school children, 1921–28. By Carroll E Palmer August 18, 1933 13 pages.
1592 Estimation of basophilic cells (reticulocytes) by examination of ordinary blood film By R R Jones August 18, 1933 10 pages.
1593 Bone marrow in tularaemia By R D Lillie and Edward Francis September 15, 1933 10 pages
1594 Incidence and clinical symptoms of minor respiratory attacks, with special reference to variation with age, sex, and season By Selwyn D Collins and Mary Gover September 22, 1933 24 pages
1595 Public Health Service publications A list of publications issued during the period January–June 1933 September 29, 1933 4 pages
1596 Estimation of fluorides in waters By Elias Elvove October 6, 1933. 4 pages
1597. Extent of rural health service in the United States, January 1, 1929–December 31, 1932 October 6, 1933 17 pages
1598 Sickness and the economic depression Preliminary report on illness in families of wage earners in Birmingham, Detroit, and Pittsburgh. By G. St J Perrott, Selwyn D Collins, and Edgar Sydenstricker. October 13, 1933 14 pages
1599 Growth and the economic depression A study of the weight of elementary school children in 1921–27 and in 1933 By Carroll E Palmer. October 20, 1933 16 pages.
1600. Encephalitis Studies on experimental transmission. By Ralph S Muckenfuss, Charles Armstrong, and H A. McCordock November 3, 1933 2 pages
1601. Experimental studies of natural purification in polluted waters VIII. Dissolved oxygen in the presence of organic matter, hypochlorites, and sulphite wastes By Emery J. Theriault and Paul D McNamee. November 10, 1933 15 pages
1602 Acute response of guinea pigs to vapors of some new commercial organic compounds. VII Dichloroethyl ether. By H H Schrenk, F A. Patty, and W P Yant. November 17, 1933 10 pages.
1603. Biological products Establishments licensed for the propagation and sale of viruses, serums, toxins, and analogous products November 17, 1933 5 pages.
1604 State and insular health authorities, 1933 Directory, with data as to appropriations and publications. December 22, 1933 17 pages.
1605. Experimental studies on acute mercurial poisoning. By Sanford M. Rosenthal December 29, 1933. 18 pages.

Supplements to the Public Health Reports

106. Whooping cough· Its nature and prevention. Information concerning a wide-spread disease for which familiarity has bred contempt. By Floyd C. Turner 1933 4 pages.
107 Malaria treatment of parenchymatous syphilis of the central nervous system By R. A. Vonderlehr. 1933. 70 pages.
*108. The sanitary privy. 1933. 45 pages. 10 cents.

Public Health Bulletins

205 Lead poisoning in a storage battery plant By Albert E Russell, Roy R. Jones, J J Bloomfield, Rollo H Britten, and Lewis R. Thompson June 1933 55 pages.

206 The intelligence of the prospective immigrant I A study of the mental ability, measured by language and nonlanguage tests, of applicants for immigrant visas at Warsaw, Poland By J D Reichard. July 1933. 35 pages

207. The health of workers in a textile plant. By Rollo H. Britten, J J Bloomfield, and Jennie C Goddard. July 1933 26 pages

208. The health of workers in dusty trades General statement and summary of findings By Lewis R Thompson, Albert E Russell, and J J Bloomfield III Exposure to dust in coal mining By Dean K. Brundage and Elizabeth S Frasier. (Section on pathology contributed by L U. Gardner.) IV. Exposure to dust in a textile plant By J J. Bloomfield and W. C. Dreessen. V. Exposure to the dusts of a silverware manufacturing plant By Jennie C. Goddard VI Exposure to municipal dust (street cleaners in New York City). By Rollo H. Britten July 1933 37 pages

209. Osteitis deformans A review of the literature and report of 11 cases. By J W. Kerr September 1933 122 pages

210. Mortality of coal miners. By Dean K. Brundage. July 1933 17 pages.

National Institute of Health Bulletin

162. I. The blacktongue (canine pellagra) preventive value of fifteen foodstuffs. By G. A Wheeler and W H. Sebrell II Pathology of experimental blacktongue By R D Lillie III. "Yellow liver" of dogs (fatty infiltration) associated with deficient diets By W H Sebrell IV The pathology of "yellow liver" of dogs. By R D Lillie and W H. Sebrell September 1933 45 pages

Unnumbered Publications

Index to Public Health Reports, vol 48, part 1 (January–June 1933) 24 pages

*National Negro Health Week poster Twentieth annual observance. 1934 Out of print.

Reprints from Venereal Disease Information

42. Cooperative clinical studies in the treatment of syphilis. Arsenical reactions By H. N Cole, Joseph E. Moore, Paul A. O'Leary, John H Stokes, Udo J. Wile, Taliaferro Clark, Thomas Parran, Jr, and Lida J. Usilton Vol. XIV, no 8 28 pages.

DEATHS DURING WEEK ENDED MARCH 31, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Mar 31, 1934	Corresponding week, 1933
Data from 86 large cities of the United States.		
Total deaths	8,867	8,125
Deaths per 1,000 population, annual basis	12 4	11 3
Deaths under 1 year of age	658	608
Deaths under 1 year of age per 1,000 estimated live births	61	[1] 52
Deaths per 1,000 population, annual basis, first 13 weeks of year	12 7	12 3
Data from industrial insurance companies		
Policies in force	67,693,698	68,658,399
Number of death claims	14,079	14,432
Death claims per 1,000 policies in force, annual rate	10 8	11 0
Death claims per 1,000 policies, first 13 weeks of year, annual rate	11 1	11.2

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Apr. 7, 1934, and Apr. 8, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 7, 1934, and Apr 8, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr 7, 1934	Week ended Apr 8, 1933
New England States								
Maine	1		1	[1] 96	14	4	0	0
New Hampshire				1	188	5	0	0
Vermont	1	2			70	17	0	0
Massachusetts	15	7		1	2,622	472	2	2
Rhode Island		4			16		0	0
Connecticut	3	4		19	23	275	1	0
Middle Atlantic States								
New York	61	94	[2] 26	[2] 23	1,058	3,977	3	6
New Jersey	18	17	15	30	702	2,036	1	2
Pennsylvania	67	90			6,371	1,747	4	7
East North Central States								
Ohio	32	29	26	16	1,621	865	1	1
Indiana	11	16	15	30	894	119	3	3
Illinois	28	22	18	43	1,911	481	11	29
Michigan	11	17	3	17	148	1,173	1	2
Wisconsin	4	3	84	38	1,429	466	5	1
West North Central States.								
Minnesota	4	6			316	1,297	1	0
Iowa [3]	6	10	9		258	4	0	4
Missouri	45	21	87	9	839	259	4	3
North Dakota	3	2	1		106	84	0	0
South Dakota	4	2			350	12	1	1
Nebraska	5	9	1	35	244	27	1	0
Kansas	8	7	11	6	345	349	1	4
South Atlantic States								
Delaware	2	3		1	146	4	1	0
Maryland [3]	8	9	11	18	1,689	28	0	1
District of Columbia	6	4	1		375	6	0	0
Virginia	21	12			2,035	274	4	3
West Virginia	14	20	51	14	47	294	1	0
North Carolina	19	24	56	22	3,201	636	0	1
South Carolina	12	8	500	352	639	229	0	0
Georgia [4]	4	10		102	780	84	0	1
Florida	18	10	1	1	444	58	0	0

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr 7, 1934, and Apr 8, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr 7, 1934	Week ended Apr 8, 1933
East South Central States								
Kentucky	8	10	32	35	668	58	4	2
Tennessee	7	13	73	66	878	35	2	2
Alabama [4]	11	11	56	43	977	51	0	0
Mississippi [3]	8	11					1	0
West South Central States								
Arkansas	5	8	34	12	249	464	0	0
Louisiana	19	10	22	15	401	29	0	0
Oklahoma [5]	5	1	80	71	439	89	2	10
Texas [4]	78	67	445	186	1,492	1,139	2	3
Mountain States								
Montana [6]		1	402	23	46	44	1	0
Idaho	1	1	1		62	36	0	0
Wyoming [6]					210	6	1	0
Colorado	3	3		29	374	4	0	1
New Mexico	5	4	6	1	138	8	1	0
Arizona	3		27	1	23	32	0	1
Utah [3]		1	4	2	440	12	0	1
Pacific States								
Washington	1	10	3	1	153	45	1	0
Oregon [6]	1	1	40	29	103	47	0	0
California [6]	44	45	34	47	828	1,219	2	4
Total	630	659	2,176	1,435	36,362	18,600	63	95

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr. 7, 1934	Week ended Apr 8, 1933
New England States								
Maine	0	0	15	23	0	0	31	1
New Hampshire	0	0	11	35	0	0	1	0
Vermont	0	0	7	12	0	1	0	0
Massachusetts	0	0	234	450	0	0	1	2
Rhode Island	0	0	2	27	0	0	0	0
Connecticut	0	0	77	167	0	0	2	0
Middle Atlantic States								
New York	3	0	835	1,116	0	0	10	6
New Jersey	1	0	239	380	0	0	1	3
Pennsylvania	2	1	999	990	0	0	6	7
East North Central States								
Ohio	5	1	820	764	1	33	2	6
Indiana	1	0	190	190	1	4	3	1
Illinois	0	0	532	507	5	5	5	8
Michigan	1	3	699	665	0	2	3	2
Wisconsin	0	0	189	160	28	1	2	10
West North Central States								
Minnesota	0	0	64	101	8	1	1	0
Iowa [3]	0	0	69	55	2	26	0	0
Missouri	0	0	117	108	5	14	2	1
North Dakota	0	0	45	9	0	1	0	0
South Dakota	0	0	6	18	0	2	1	5
Nebraska	0	0	38	33	2	2	0	5
Kansas	1	0	74	67	2	1	4	1
South Atlantic States								
Delaware	0	0	9	17	0	0	2	0
Maryland [3]	0	0	81	120	0	0	6	3
District of Columbia	0	0	7	12	0	0	0	0
Virginia	0	0	21	61	0	1	3	7
West Virginia	1	0	87	25	1	0	3	4
North Carolina	0	0	27	53	0	0	0	0
South Carolina	0	0	10	10	0	2	5	7
Georgia [4]	0	0	7	6	0	1	7	4
Florida	2	1	1	3	0	0	5	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr 7, 1934, and Apr 8, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr 7, 1934	Week ended Apr 8, 1933	Week ended Apr 7, 1934	Week ended Apr 8, 1933
East South Central States								
Kentucky	0	0	57	64	1	0	2	10
Tennessee	0	0	44	25	0	2	4	4
Alabama [4]	0	0	10	5	0	2	1	2
Mississippi [3]	2	0	3	16	6	0	8	3
West South Central States								
Arkansas	0	0	5	3	1	53	0	0
Louisiana	0	0	25	10	1	0	11	23
Oklahoma [5]	0	0	47	13	4	5	1	0
Texas [4]	2	0	100	73	73	33	6	11
Mountain States								
Montana [6]	0	0	9	18	0	2	1	0
Idaho	0	0	2	2	1	8	0	0
Wyoming [6]	0	0	9	11	1	0	0	2
Colorado	0	0	33	31	5	10	2	1
New Mexico	0	0	13	12	1	2	1	2
Arizona	3	0	25	10	0	0	0	0
Utah [3]	0	0	7	9	0	0	0	0
Pacific States								
Washington	0	0	66	62	9	9	3	1
Oregon [6]	0	0	20	16	9	4	0	3
California [6]	6	3	141	161	2	43	7	7
Total	30	9	6, 128	6, 725	169	270	153	154

[1] Includes delayed reports
[2] New York City only
[3] Week ended earlier than Saturday
[4] Typhus fever, week ended Apr 7, 1934, 16 cases, as follows Georgia, 2, Alabama 2, Texas, 12
[5] Exclusive of Oklahoma City and Tulsa
[6] Rocky Mountain spotted fever, week ended Apr 7, 1934, 9 cases, as follows Montana, 3, Wyoming, 3; Oregon, 1, California, 2

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus-meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1934										
Florida	1	23	10	10	503	5	1	12	0	5
Mississippi		37	6, 159	1, 454	9, 258	193	5	67	2	8
March 1934										
Connecticut	2	24	41		145		0	337	0	4
Delaware		7			802		0	48	0	2
District of Columbia	1	47	5		2, 708		0	69	0	1
Massachusetts	7	64		1	9, 891		2	1, 209	0	3
Nebraska	2	35	26		992		2	146	17	6
Wyoming					323		0	32	2	0

February 1934

	Cases
Chicken pox	
Florida	218
Mississippi	699
Dysentery	
Florida	2
Mississippi (amoebic)	28
Hookworm disease	
Mississippi	207
Lethargic encephalitis	
Florida	1
Mumps	
Florida	51
Mississippi	457
Puerperal septicemia	
Mississippi	25
Rabies in animals	
Mississippi	11
Trachoma	
Mississippi	14
Whooping cough	
Florida	47
Mississippi	1,802

March 1934

	Cases
Anthrax	
Delaware	1
Massachusetts	1
Chicken pox	
Connecticut	506
Delaware	55
District of Columbia	127
Massachusetts	1,004
Nebraska	283
Wyoming	44
Conjunctivitis	
Connecticut	19
Dysentery	
Connecticut (amoebic)	2
Massachusetts (amoebic)	6
Massachusetts (bacillary)	3
Nebraska (amoebic)	1
German measles	
Connecticut	10
Massachusetts	57
Wyoming	8
Lead poisoning	
Connecticut	2
Massachusetts	3
Lethargic encephalitis	
Connecticut	4
District of Columbia	1
Massachusetts	5
Mumps	
Connecticut	677
Delaware	35
Massachusetts	644
Nebraska	98
Ophthalmia neonatorum:	
Massachusetts	177
Rabies in animals	
Connecticut	5
Rocky Mountain spotted fever	
Wyoming	5
Scabies	
Wyoming	1
Septic sore throat	
Connecticut	12
Delaware	1
Massachusetts	24
Nebraska	1
Wyoming	5
Tetanus	
Connecticut	1
Massachusetts	2
Trachoma	
Massachusetts	3
Trichinosis	
Connecticut	4
Massachusetts	1
Typhus fever	
Massachusetts	1
Undulant fever	
Connecticut	1
Massachusetts	1
Nebraska	1
Vincent's infection	
Wyoming	3
Whooping cough	
Connecticut	277
Delaware	42
District of Columbia	187
Massachusetts	1,969
Nebraska	207
Wyoming	33

EPIDEMIC OF TYPHOID FEVER IN AUGUSTA, MAINE

According to a report dated April 7, 1934, there was an epidemic of typhoid fever in Augusta, Maine. The first case occurred on March 26 in the family of a milk distributor. Six additional cases, with two deaths, occurred later in the same family. Sixty-two cases had been reported to date of report.

PLAGUE-INFECTED GROUND SQUIRRELS, KERN AND TULARE COUNTIES, CALIF.

The Director of Public Health of the State of California under date of March 30, 1934, reports the discovery of acute plague in ground squirrels found dead within an area of 6 square miles in Kern and Tulare Counties, Calif., approximately 30 miles north and east of Bakersfield and about 16 miles east of Delano.

Under date of April 9, 1934, he reported that 10 ground squirrels found dead or shot 14 to 18 miles east of Delano, Kern County, and 1 ground squirrel found dead in White River, Tulare County, had been found positive for plague. On April 10, 1934, a lot of 6 ground squirrels from a ranch 10 miles east of Delano, in Kern County, was also found positive for plague.

Positive demonstration was made anatomically and macroscopically, and morphologically characteristic bacilli were found. Cultures for animal inoculation had been prepared.

WEEKLY REPORTS FROM CITIES

City reports for week ended Mar 31, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	2	8	2	0	0	0	10	22
New Hampshire											
Concord	0	------	0	11	4	0	0	0	0	0	14
Manchester	0	------	0	3	1	1	0	0	0	0	14
Nashua	0	------	0	8	0	1	0	0	0	0	------
Vermont											
Barre	0	------	0	0	1	0	0	0	0	0	3
Burlington	0	------	0	0	0	6	0	0	0	2	9
Massachusetts											
Boston	2	------	0	354	21	68	0	16	0	110	213
Fall River	0	------	0	0	1	0	0	2	0	6	33
Springfield	0	------	0	5	2	5	0	0	0	12	46
Worcester	1	------	0	0	5	5	0	1	0	15	52
Rhode Island											
Pawtucket	0	------	0	0	0	3	0	0	0	0	20
Providence	2	------	0	1	3	6	0	2	0	11	71
Connecticut											
Bridgeport	0	------	0	4	6	13	0	4	0	0	43
Hartford	0	------	0	0	3	15	0	1	0	4	28
New Haven	0	1	0	0	4	3	0	2	0	2	46
New York											
Buffalo	1	------	0	178	32	24	0	8	0	31	135
New York	30	24	5	111	190	319	0	81	6	108	1,331
Rochester	1	------	0	0	3	63	0	2	1	10	72
Syracuse	0	------	0	4	3	3	0	1	0	45	54
New Jersey											
Camden	1	1	0	110	6	4	0	1	0	0	45
Newark	0	6	1	7	4	23	0	7	0	36	90
Trenton	0	1	0	65	2	17	0	2	0	11	36
Pennsylvania											
Philadelphia	6	3	2	932	44	93	0	29	0	74	525
Pittsburgh	11	3	4	155	29	56	0	6	0	28	199
Reading	0	------	0	3	3	6	0	0	0	6	22
Scranton	0	------	0	2	0	0	0	0	0	9	------
Ohio											
Cincinnati	6	------	3	27	19	31	0	6	0	9	149
Cleveland	9	57	2	82	33	148	0	17	0	115	237
Columbus	2	1	1	5	5	85	0	5	0	37	95
Toledo	2	1	0	101	16	17	0	2	0	137	83
Indiana											
Fort Wayne	4	------	0	14	0	20	0	0	1	1	24
Indianapolis	0	------	0	467	11	34	0	0	0	35	------
South Bend	0	------	1	2	1	5	0	0	0	0	23
Terre Haute	0	------	0	0	0	0	0	2	0	0	14
Illinois											
Chicago	3	4	4	241	54	269	0	33	0	172	683
Springfield	0	------	0	271	4	0	0	2	0	13	30
Michigan											
Detroit	8	3	0	86	45	207	0	17	1	101	273
Flint	2	1	1	11	5	83	0	1	0	9	30
Grand Rapids	0	------	1	3	2	42	0	0	0	4	40
Wisconsin											
Kenosha	0	------	0	3	1	18	0	0	0	6	8
Madison	1	------	------	2	------	9	0	1	0	40	19
Milwaukee	0	2	2	19	11	111	0	3	0	93	99
Racine	0	------	0	2	0	4	2	0	0	5	12
Superior	0	------	0	0	0	0	0	0	0	0	8
Minnesota											
Duluth	------	------	------	------	------	------	------	------	------	------	------
Minneapolis	4	------	1	10	7	16	0	0	0	4	97
St. Paul	0	------	0	1	5	6	0	0	0	21	60
Iowa											
Des Moines	1	------	------	0	------	13	0	------	0	0	36
Sioux City	1	------	------	6	------	1	0	------	0	3	------
Waterloo	0	------	------	0	------	3	0	------	0	13	------
Missouri											
Kansas City	2	------	2	6	28	25	0	7	0	32	125
St Joseph	3	------	1	15	16	4	0	2	0	0	57
St Louis	23	------	1	92	18	34	4	11	1	68	265

City reports for week ended Mar 31, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Dakota											
Fargo	0	------	0	45	0	0	0	0	0	6	6
South Dakota											
Aberdeen	1	------	0	9	0	3	0	0	0	5	------
Sioux Falls	0	------	0	1	0	0	0	0	0	0	7
Nebraska:											
Omaha	0	------	0	136	7	13	3	3	0	2	60
Kansas											
Topeka	0	------	1	4	3	2	0	0	0	32	24
Wichita	0	------	0	6	5	1	0	2	0	19	40
Delaware											
Wilmington	1	------	0	65	3	0	0	0	0	2	40
Maryland											
Baltimore	1	5	3	857	30	45	0	13	0	166	220
Cumberland	0	------	1	0	1	3	0	0	0	0	17
Frederick	------	------	------	------	------	------	------	------	------	------	------
Dist of Columbia											
Washington	9	1	0	596	12	16	0	10	0	45	178
Virginia											
Lynchburg	0	------	0	1	2	0	0	0	0	20	26
Norfolk	1	------	1	76	6	7	0	1	0	8	42
Richmond	1	------	1	305	7	0	0	6	0	6	66
Roanoke	1	------	1	0	0	3	0	1	0	0	15
West Virginia											
Charleston	0	1	1	0	4	0	0	0	2	0	23
Huntington	1	------	0	0	0	18	0	0	0	0	------
Wheeling	0	------	0	6	3	5	0	0	1	1	13
North Carolina											
Raleigh	0	------	0	4	2	3	0	1	0	6	18
Wilmington	0	------	0	3	3	0	0	0	0	7	13
Winston-Salem	1	1	0	45	2	0	0	2	0	2	18
South Carolina.											
Charleston	1	44	0	30	2	0	0	1	0	1	28
Columbia	0	------	1	0	1	0	0	0	0	0	14
Greenville	0	------	0	2	4	1	0	0	0	5	13
Georgia:											
Atlanta	5	7	3	147	17	3	0	5	0	2	117
Brunswick	0	------	0	37	0	0	0	0	3	0	3
Savannah	3	42	3	37	1	0	0	0	0	5	37
Florida											
Miami	1	2	0	62	3	0	0	3	2	7	37
Tampa	4	------	0	80	3	1	0	1	0	1	24
Kentucky											
Ashland	0	------	------	21	------	0	0	------	0	2	------
Lexington	2	10	0	0	3	2	0	2	1	0	19
Louisville	4	2	0	7	11	25	0	5	0	31	90
Tennessee											
Memphis	2	------	6	181	24	4	0	7	3	1	113
Nashville	0	------	0	37	4	1	0	5	0	15	62
Alabama											
Birmingham	0	1	1	80	3	5	0	5	0	3	88
Mobile	2	1	0	18	3	0	0	0	0	1	19
Montgomery	2	------	------	81	------	1	0	------	0	2	------
Arkansas											
Fort Smith	1	------	------	1	------	1	0	------	0	0	------
Little Rock	0	------	1	81	5	1	0	3	0	0	10
Louisiana.											
New Orleans	10	2	4	43	16	11	0	11	1	0	151
Shreveport	0	------	0	14	1	1	0	2	0	0	33
Texas											
Dallas	8	1	1	5	9	4	1	1	0	4	65
Fort Worth	2	------	0	1	5	10	0	1	0	0	33
Galveston	1	------	0	1	2	5	0	0	0	0	8
Houston	1	------	1	3	10	6	4	5	0	1	76
San Antonio	5	------	3	5	7	4	0	6	0	1	65
Montana											
Billings	0	------	0	0	0	0	0	0	0	1	0
Great Falls	0	------	0	2	3	1	0	0	0	0	9
Helena	0	------	0	0	0	0	0	0	0	0	4
Missoula	0	------	0	0	2	0	0	0	0	1	8
Idaho:											
Boise	0	------	0	0	0	4	3	0	0	0	6
Colorado:											
Denver	2	57	1	132	8	12	0	4	0	103	75
Pueblo	0	------	0	10	3	3	0	0	0	9	8

City reports for week ended Mar 31, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
New Mexico											
Albuquerque	2		0	9	2	3	0	2	0	2	10
Utah											
Salt Lake City	0		0	184	4	12	0	3	0	39	40
Nevada											
Reno	0		0	0	0	0	0	0	0	0	2
Washington											
Seattle	0			2	6	37	0	7	0	74	87
Spokane	0	1	1	28	3	2	0		0	11	36
Tacoma	0		0	50	5	0	0	1	0	0	33
Oregon											
Portland	1		0	9	4	7	1	1	0	19	76
Salem	0	3	0	0	0	0	0	0	0	1	
California											
Los Angeles	25	26	2	60	16	43	0	32	0	40	316
Sacramento	0		0	0	4	2	0	3	0	0	25
San Francisco	0	2	0	170	7	23	0	10	0	16	147

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts				Missouri			
Springfield	0	1	0	St Joseph	1	1	0
New York				St Louis	0	1	0
New York	5	3	0	Nebraska			
Pennsylvania				Omaha	0	1	0
Pittsburgh	2	0	0	District of Columbia			
Ohio				Washington	1	0	0
Cleveland	4	1	1	Tennessee			
Indiana				Memphis	2	0	0
Fort Wayne	0	0	1	Washington			
Indianapolis	1	1	0	Seattle	0	0	1
Illinois				California			
Chicago	8	3	0	Los Angeles	1	0	0
Michigan				San Francisco	2	0	0
Detroit	1	0	1				
Minnesota							
Minneapolis	1	1	1				

Lethargic encephalitis —Cases Boston, 1, Springfield, Mass , 1, New York, 1, Trenton, 1; Pittsburgh, 2; Detroit, 1, St Paul, 1.
Pellagra —Cases Raleigh, 1, Charleston, S C., 3
Typhus fever —Cases Atlanta, 1, Savannah, 1; Los Angeles, 1

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended March 24, 1934.—During the 2 weeks ended March 24, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta [1]	British Columbia	Total
Cerebrospinal meningitis	1		1		3				1	6
Chicken pox		3		206	552	58	28	10	67	924
Diphtheria			3	43	17	11	7	3	1	85
Dysentery				3						3
Erysipelas		1		14	16	3	1		3	38
Influenza		46		10	16	5	10		37	124
Lethargic encephalitis						1	2			3
Measles		7		314	129	856	171	1	56	1,534
Mumps					521	11	23	1	107	663
Paratyphoid fever		1			3					4
Pneumonia		21			42		4		23	90
Poliomyelitis						1			2	3
Scarlet fever	2	15	18	170	425	35	3	9	246	923
Smallpox									1	1
Trachoma						1			3	4
Tuberculosis	4	5	10	143	95	6	9	6	45	323
Typhoid fever			3	69	5		4		1	82
Undulant fever		1		1	6		1			9
Whooping cough		20		273	411	17	17	47	30	815

[1] No report was received from Alberta for the week ended Mar 24, 1934

Quebec Province—Communicable diseases—2 weeks ended March 24, 1934—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended March 24, 1934, as follows:

Disease	Cases	Disease	Cases
Chicken pox	206	Puerperal septicemia	3
Diphtheria	43	Scarlet fever	170
Dysentery	3	Tuberculosis	143
Erysipelas	14	Typhoid fever	69
German measles	30	Undulant fever	1
Influenza	10	Whooping cough	273
Measles	284		

Montreal—Amoebic dysentery.—According to newspaper reports, 21 cases of amoebic dysentery occurred in Montreal, Canada, from July 1933 to March 28, 1934.

CUBA

Provinces—Notifiable diseases—4 weeks ended January 27, 1934.—During the 4 weeks ended January 27, 1934, cases of certain notifiable diseases were reported in the provinces of Cuba, as follows

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer			1	2			3
Chicken pox		1	2	1		2	6
Diphtheria	1	1	7	4	2		15
Hookworm disease					1		1
Leprosy	1			4	2		7
Malaria	228	17	399	1,787	64	1,066	3,561
Measles	1			4		9	14
Scarlet fever						1	1
Tuberculosis	13	125	31	69	17	5	260
Typhoid fever		4	3	15	3	15	40

CZECHOSLOVAKIA

Communicable diseases—January 1934.—During the month of January 1934, certain communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	2		Paratyphoid fever	6	2
Cerebrospinal meningitis	7	3	Poliomyelitis	4	1
Chicken pox	317		Puerperal fever	57	22
Diphtheria	2,499	177	Scarlet fever	2,342	31
Dysentery	1		Trachoma	111	
Influenza	236	5	Typhoid fever	389	21
Malaria	2				

JAMAICA

Communicable diseases—4 weeks ended March 24, 1934.—During the 4 weeks ended March 24, 1934, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows·

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Cerebrospinal meningitis	2	1	Leprosy		2
Chicken pox	5	32	Poliomyelitis		2
Diphtheria		5	Puerperal fever	2	4
Dysentery	27	21	Tuberculosis	39	89
Erysipelas		2	Typhoid fever	16	74

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Mar 30, 1934, pp 438–450 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued Apr 27, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

CHOLERA

Philippine Islands —During the week ended April 7, 1934, cholera was reported in the Philippine Islands as follows Bohol Province—Calape, 1 case, 1 death; Tubigon, 1 case, 1 death. Occidental Negros Province—Escalante, 3 cases, 3 deaths

PLAGUE

Argentina—Rosario —During the month of March 1934, 1 case of plague was reported in the suburbs of Rosario, Argentina.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 17

APRIL 27 - - - - - 1934

IN THIS ISSUE

Standardization of Gas Gangrene (Perfringens) Antitoxin
Cities With Milk Sanitation Ratings of 90% or More
Deaths in Large Cities During the Week Ended April 7
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON. 1934

For sale by the Superintendent of Documents, Washington, D C - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law: United States Code, title 42, sections 7, 30, 93; title 44, section 220

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health

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Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies Indexes will be supplied upon request.

CONTENTS

	Page
The standardization of gas gangrene (perfringens) antitoxin	525
Milk-sanitation ratings of cities—Cities for which milk-sanitation ratings of 90 percent or more were reported by State milk-sanitation authorities during the months of February and March 1934	530
Court decision on public health	531
Deaths during week ended April 7, 1934:	
Deaths and death rates for a group of large cities in the United States	531
Death claims reported by insurance companies	531
PREVALENCE OF DISEASE	
United States:	
Current weekly State reports:	
Reports for weeks ended April 14, 1934, and April 15, 1933	532
Summary of monthly reports from States	534
Cases of venereal diseases reported for February 1934	535
Weekly reports from cities:	
City reports for week ended April 7, 1934	536
Foreign and insular:	
Canada—Quebec Province—Communicable diseases—2 weeks ended April 7, 1934	539
Cuba—Notifiable diseases—4 weeks ended February 24, 1934	539
Puerto Rico—Notifiable diseases—4 weeks ended March 24, 1934	540
Yugoslavia—Communicable diseases—February 1934	540
Cholera, plague, smallpox, typhus fever, and yellow fever:	
Cholera	541
Plague	543
Smallpox	546
Typhus fever	551
Yellow fever	554

PUBLIC HEALTH REPORTS

VOL. 49 APRIL 27, 1934 NO. 17

THE STANDARDIZATION OF GAS GANGRENE (PERFRINGENS) ANTITOXIN

By IDA A. BENGTSON, *Senior Bacteriologist, National Institute of Health, United States Public Health Service*

The use of gas gangrene (*perfringens* or *welchii*) antitoxin during the World War gave rise to the occasion for standardization of the product, and a standard was promulgated in 1920 (1). As in the case of diphtheria and tetanus antitoxins, it is desirable that the product be of uniform and high potency. Following the war, interest in this antitoxin diminished, owing to the comparatively small number of cases of gas gangrene occurring in civil practice. Recently, however, interest in the subject has been revived. The use of the antitoxin has been advocated in the treatment of cases of toxemia related to intestinal obstruction, peritonitis, and other abdominal conditions. Also increase in the number of automobile injuries has probably influenced the incidence of traumatic gas gangrene. The use of the antitoxin for the treatment of compound fractures appears to be indicated in certain cases as an adjuvant to surgical measures.

In December 1930 the official unit for measuring the potency of *perfringens* antitoxin was changed to one one-hundredth the former amount. The change was made in the interest of greater practical convenience of expressing the unitage of a given antitoxin in terms of whole numbers. The unitage of serums measured by the former standard usually fell below 5. With the new standard the figure is multiplied by 100. It is not to be inferred that the value of the antitoxin is thereby increased, or that its value is necessarily commensurate with that of tetanus antitoxin with which it is often combined in the product known as tetanus-*perfringens* or tetanus gas gangrene antitoxin.

Definition of the American unit.—The definition of the unit and the method for determining the potency of a given serum may be stated as follows:

The standard *perfringens* antitoxin is diluted so that 1 cc contains 50 units. To estimate the potency of a commercial antitoxin, the test toxin shall first be standardized by inoculating pigeons intramuscularly with 1 unit of standard serum mixed with varying amounts of toxin to determine the smallest dose of toxin which will overcome this amount of serum and cause the death of the pigeon in 24 hours. This dose of toxin, called the "test dose", is usually somewhat greater than 10 minimal lethal doses The test dose of toxin is then mixed with varying amounts of the serum to be tested and injected into a second series of pigeons, and that amount of serum which gives protection for 24 hours against the test dose of toxin shall be considered to contain 1 unit The serum-toxin mixtures are left 1 hour at room temperature before injection. Pigeons should weigh preferably between 325 and 375 grams; but the doses of toxin and antitoxin shall be proportional to the weight, 350 grams being considered the standard weight.

Both the standard antitoxin and a standard dried toxin are maintained at the National Institute of Health under conditions suitable to prevent deterioration.

The international standard.—In 1931 this laboratory cooperated with the laboratories of other countries in carrying out tests with a view to establishing an international standard. At the request of the Permanent Standards Commission of the Health Organization of the League of Nations, the National Institute for Medical Research, London, furnished samples of gas-gangrene antitoxin (*perfringens*), and of *perfringens* toxin to various laboratories in order to "explore the possibility of obtaining international agreement regarding the adoption of a standard for this antitoxin, the definition of a unit of activity in terms of such standard, and the biological assay of gas-gangrene antitoxin (*perfringens*)."

It was recommended by the group of experts on the standardization of gas gangrene antitoxin to the Permanent Standards Commission that the standard preparation and unit adopted in the United States be considered suitable for international use.

Comparative tests of the British and the American units had previously been made in the laboratory of the National Institute for Medical Research, London. A sample of the dried British antitoxin labeled to contain 18 U.S.A. units (i.e., 1,800 new units) as established by the intravenous injection of mice was submitted to the National Institute of Health, Washington, for confirmatory tests on pigeons.

The results of the test on pigeons are shown in the protocol in table 1 (the serums being diluted so that 1 unit of each serum was contained in 1 cc).

TABLE 1.—*Protocol of test in pigeons to determine comparative value of British and American standard antitoxins*

[Toxin, HL24, dose per 350 grams, 0 075 gram]

Pigeon no	Weight	Actual dose of toxin	Amount of 1/50th dilution	Antitoxin					Result after 24 hours
				Source	Units per 350 grams	Actual units	Dilution	Amount of dilution	
	Grams	*Gram*	*Cc*					*Cc*	
90	295	0 063	3 15	Medical Research Council H2771 (British)	1 25	1 05	1/1800	1 05	Survived.
91	345	074	3 70		1 25	1 23	1/1800	1 23	Do
92	385	083	4 13		1 25	1 38	1/1800	1 38	Do
93	295	063	3 15	do	1 0	84	1/1800	84	Died
94	355	076	3 80		1 0	1 01	1/1800	1 01	Survived.
95	405	087	4 34		1 0	1 16	1/1800	1 16	Do
96	300	064	3 20	do	0 75	64	1/1800	64	Died
97	370	079	3 95		75	79	1/1800	79	Do.
98	435	093	4 65		75	93	1/1800	93	Do
99	305	065	3 25	National Institute of Health (United States)	1 0	87	1/50	87	Do
100	380	082	4 10		1 0	1 08	1/50	1 08	Do
101	435	093	4 65		1 0	1 24	1/50	1 24	Survived.

The results show close agreement. Of the three pigeons inoculated with the mixture of toxin and the amount of British antitoxin purported to correspond to 1 unit of U.S.A antitoxin, 2 survived and 1 died, while of the pigeons inoculated with mixture of toxin and 1 unit of U.S.A. antitoxin 1 survived and the other 2 died. All of the pigeons inoculated with 1.25 units of the British antitoxin survived, and all of those inoculated with 0.75 units died.

For carrying out the international tests, the reagents listed in the following, with descriptions, were received from the National Institute for Medical Research, London:

1. A solution of antitoxin (*perfringens*) prepared from the dried standard antitoxin maintained in the National Institute of Health, Washington. The solution was made in the manner prescribed by the National Institute of Health, and 1 cc of the standard solution is equivalent to 50 U.S.A. units.
2. A solution of antitoxin (*perfringens*) prepared from a dried standard antitoxin maintained in the National Institute for Medical Research, London; 1 cc of this standard is equivalent to 20 U.S A. units. The results of tests made at the National Institute of Medical Research indicated that 1 cc of a one fiftieth dilution of the American standard solution and 1 cc of a one twentieth dilution of the British standard solution were identical in potency, i.e., equivalent to 1 unit (U.S.A. official standard).
3. A dried preparation of *perfringens* toxin. This was prepared by precipitating a bacteria-free filtrate from a 16-hour growth of *Cl. perfringens* with ammonium sulphate, removing the resulting precipitate and drying over phosphorus pentoxide.
4. A sample of gas gangrene (*perfringens*) (natural serum) for purposes of trial assay.

The test was to be carried out by injecting mixtures of the toxin and antitoxin into the tail veins of mice weighing between 17 and 20 g. The American standard solution was to be diluted 1:50 and the British

1:20. The toxin was to be diluted so that 10 mg of the toxin were contained in 1 cc; mixture of each of the standard antitoxin dilutions with the toxin solution was to be made so that 0.5 cc of each mixture (the volume injected into a mouse) contained 0.2 cc of the diluted antitoxin (equivalent to one fifth the American unit) plus a varying quantity of the toxin solution. The mixtures were to be allowed to stand 45 to 60 minutes at room temperature. An observation period of 48 hours was recommended.

The protocol of one of the tests made at the National Institute for Medical Research as shown in table 2 was included

TABLE 2.—*Results of comparative tests in mice with the American and British standard solutions by the National Institute for Medical Research, London*

ONE FIFTH AMERICAN UNIT, WASHINGTON STANDARD SOLUTION

Toxin dose (Mg)	Number of mice used	Number dying	Number surviving	Proportion surviving
2.9	6	6	0	0/6
2.8	6	6	0	0/6
2.7	6	6	0	0/6
2.6	6	2	4	4/6
2.5	6	0	6	6/6
2.4	6	0	6	6/6

ONE FIFTH AMERICAN UNIT, BRITISH STANDARD SOLUTION

Toxin dose (Mg)	Number of mice used	Number dying	Number surviving	Proportion surviving
2.9	6	6	0	0/6
2.8	6	6	0	0/6
2.7	6	6	0	0/6
2.6	6	2	4	4/6
2.5	6	0	6	6/6
2.4	6	1	5	5/6

On receipt of the reagents, tests were made in accordance with the methods suggested The results obtained in the test designated to show the comparative values of the British and American standard solutions are shown in the protocol in table 3.

TABLE 3.—*Results of comparative tests in mice with the American and British standard solutions by the National Institute of Health, Washington*

ONE FIFTH AMERICAN UNIT, WASHINGTON STANDARD SOLUTION

Toxin dose (Mg)	Number of mice used	Number dying	Number surviving	Proportion surviving
2.9	6	6	0	0/6
2.8	6	6	0	0/6
2.7	6	4	2	2/6
2.6	6	2	4	4/6
2.5	6	2	4	4/6
2.4	6	0	6	6/6

ONE FIFTH AMERICAN UNIT, BRITISH STANDARD SOLUTION

Toxin dose (Mg)	Number of mice used	Number dying	Number surviving	Proportion surviving
2.9	6	6	0	0/6
2.8	6	6	0	0/6
2.7	6	6	0	0/6
2.6	6	1	5	1/6
2.5	6	0	6	6/6
2.4	6	0	6	6/6

The values are in close agreement with those shown in the test of the National Institute for Medical Research, London.

The results of the test to determine the potency of unknown serums are shown in the protocol presented in table 4.

TABLE 4.—*Tests on the antitoxin of unknown potency*

[Dose of toxin, 0.26 mg]

Dilution of antitoxin	Number of mice used	Number dying	Number surviving	Proportion surviving
1/150	6	0	6	6/6
1/175	6	0	6	6/6
1/200	6	0	6	6/6
1/225	6	4	2	2/6
1/250	6	6	0	0/6

The potency of the antitoxin may be considered to be between 200 and 225 units per cc. The results obtained by other laboratories (2) participating in the test are shown in table 5.

TABLE 5.—*Results of tests on the antitoxin of unknown potency by 8 participating laboratories*

	Number of units
Denmark: State Serum Institute, Copenhagen	235–250
France: Pasteur Institute, Paris	200
Germany:	
State Institute for Experimental Therapy, Frankfurt (Main)	220
State Department of Health, Berlin	200
Great Britain:	
Wellcome Physiological Research Laboratories, Beckenham, Kent	200
The Lister Institute, Elstree, Herts	200
National Institute for Medical Research, London	210
United States: National Institute of Health	200–225

It is thus evident that 7 of the 8 participants in the test reported values ranging from 200 to 225 units per cc.

On the basis of the results of the tests made by the eight participants in the international tests, it was recommended to the international conference of the Health Section of the League of Nations that the standard preparation and unit adopted in the United States be considered suitable for international use. This recommendation was adopted.

Much credit is due the National Institute for Medical Research, London, for organizing and directing the work of carrying out the international tests.

REFERENCES

(1) Hygienic Laboratory Bull. No. 122, p. 13. (1920.)

(2) League of Nations Health Organization. Report of the Permanent Commission on biological standardization, London, June 23, 1931. Report by Dr. P. Hartley, National Institute for Medical Research, London, p. 13.

MILK-SANITATION RATINGS OF CITIES

Cities for Which Milk-Sanitation Ratings of 90 Percent or More Were Reported by State Milk-Sanitation Authorities During the Months of February and March 1934

In accordance with the policy announced in the PUBLIC HEALTH REPORTS of January 26, 1934, in which issue was first published the list of cities for which milk-sanitation ratings of 90 percent or more had been reported, additional supplementary lists of such ratings will be published each month or two. The first supplementary list, cities reported for January 1934, was printed in the PUBLIC HEALTH REPORTS for February 23, 1934. A table is presented herewith showing the cities for which ratings of 90 percent or more were reported during the months of February and March 1934.

The rules governing the inclusion of cities in these lists and the significance of the milk-sanitation ratings made in accordance with the Public Health Service rating methods were presented in the PUBLIC HEALTH REPORTS of January 26, 1934, and in Reprint No. 1610.

Cities included in this list and in the previous lists are again advised to bring their milk-sanitation status to the level required by the 1933 edition of the Public Health Service Milk Ordinance and Code, since this edition will be used for ratings made in 1934. Cities which are not now on the lists should improve their milk supplies as much as possible and then request the State milk-control authority to determine their ratings

State milk-control authorities are urged to equip themselves to make milk-sanitation ratings of their cities as soon as possible in fairness to the cities. States already equipped for this work should not permit ratings of their cities to lapse, as no rating more than 2 years old will be included in the complete semiannual revision of the list to be published next July.

Cities having ratings of 90 percent or more according to reports received during February and March 1934

City	Pasteurized milk rating	Raw milk rating	Percentage of milk pasteurized	Date of rating
Las Cruces, N.Mex	95	95	20	February 27, 1934
Bartlesville, Okla	96	95	15	March 6, 1934
Tulsa, Okla	94	93	74	February 16, 1934.
Abilene, Tex	96	96	68	November 22, 1933.
Corsicana, Tex		92	0	February 22, 1934.
Denton, Tex	97	99	56	November 1933.

COURT DECISION ON PUBLIC HEALTH

Barbering ordinance held unconstitutional.—(Nebraska Supreme Court; *Ernesti et al.* v. *City of Grand Island et al*, 251 N.W. 899; decided Dec 22, 1933) An ordinance of the city of Grand Island on barbering contained, among other things, sanitary requirements and provisions fixing hours when barber shops could open and close. Persons engaged in operating or employed in beauty shops or hair dressing parlors patronized by women and children were, by the terms of the ordinance, exempted from its provisions. In a suit brought against the city and others it was claimed that the ordinance was discriminatory as to the closing hour because its terms did not apply to but expressly excepted beauty parlors, although they performed in many respects the same service as barber shops. The defendants sought to justify the ordinance as a health measure authorized to be enacted by the city council under the police power.

The supreme court stated that the acts performed on customers of barber shops and on customers of beauty shops seemed very similar in their nature, and that, in their relation to health and disease, about the only real difference was that arising from the difference in the sexes treated. Proceeding, the court said that "Under the constitution, persons in the same class, or who should be considered as included within the relations and circumstances provided for, must be governed by the same rules; otherwise the legislation is unconstitutional." The conclusion reached was that the ordinance was unconstitutional and void, the court summing the matter up in the following language:

> Without covering the vast field opened up by the arguments and briefs of the parties, it is sufficient to say that the classification by the ordinance of barbers as within the rules and the express exemption therefrom of beauty shop operators is discriminatory in that it is not uniform as to classes doing similar work, is arbitrary under the evidence, and is unconstitutional. No reason of public policy and no substantial difference of circumstances authorize the exemption * * *

DEATHS DURING WEEK ENDED APR. 7, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Apr 7, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	9,063	8,325
Deaths per 1,000 population, annual basis	12.6	11.6
Deaths under 1 year of age	642	586
Deaths under 1 year of age per 1,000 estimated live births	60	[1] 50
Deaths per 1,000 population, annual basis, first 14 weeks of year	12.7	12.2
Data from industrial insurance companies		
Policies in force	67,704,011	68,561,926
Number of death claims	14,547	13,353
Death claims per 1,000 policies in force, annual rate	11.2	10.2
Death claims per 1,000 policies, first 14 weeks of year, annual rate	11.1	11.1

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Apr. 14, 1934, and Apr. 15, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr 14, 1934, and Apr 15, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr. 15, 1933
New England States								
Maine	2		3	3	33	5	0	1
New Hampshire					164		0	0
Vermont					94	50	0	0
Massachusetts	20	28		1	2,257	426	2	2
Rhode Island		4			5		0	0
Connecticut	3	5	6	7	55	242	2	1
Middle Atlantic States								
New York	60	53	[1] 11	[1] 28	1,260	3,771	0	8
New Jersey	12	19	13	8	673	1,454	2	4
Pennsylvania	68	85			5,469	1,403	3	8
East North Central States								
Ohio	23	38	81	154	1,191	811	1	1
Indiana	26	17	30	20	1,130	141	3	1
Illinois	22	32	15	30	1,784	691	6	13
Michigan	13	14	1	10	179	1,363	0	2
Wisconsin	2	4	27	49	1,255	462	1	0
West North Central States								
Minnesota	6	7	1		263	844	0	0
Iowa [2]	12	11	10		350	30	3	0
Missouri	71	19	101	5	729	257	6	1
North Dakota	4	4	1		117	50	0	0
South Dakota	12	3		1	336	14	0	0
Nebraska	1	5		15	324	29	1	4
Kansas	9	7	1	1	359	359	1	1
South Atlantic States								
Delaware	2	2	1	2	140	6	0	0
Maryland [2, 3]	2	8	18	6	1,985	16	0	3
District of Columbia	11	5		2	329	8	0	2
Virginia	17	5			1,377	406	7	0
West Virginia	6	9	21	8	166	177	2	0
North Carolina	19	9	28	11	2,343	653	2	0
South Carolina	8	14	420	376	695	288	0	0
Georgia [2]	10	8		90	757	128	0	2
Florida	4	10	1	8	569		0	2

NOTE.—See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr. 14, 1934, and Apr 15, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr 15, 1933
East South Central States								
Kentucky	16	5	20	26	344	144	1	2
Tennessee	12	14	80	70	702	56	3	4
Alabama [3]	17	14	48	37	811	82	0	4
Mississippi	4	4					2	0
West South Central States								
Arkansas	10	9	10	24	176	252	2	0
Louisiana	21	10	5	24	365	38	0	1
Oklahoma [4]	4	6	52	34	453	95	3	2
Texas [3]	78	49	350	118	1,606	1,263	1	3
Mountain States								
Montana	1		247	6	109	39	0	0
Idaho [5]					96	20	0	0
Wyoming [5]					44	5	0	0
Colorado [5]	4	4		37	343	1	1	0
New Mexico	3	21	26	2	105	6	1	0
Arizona	3		2	5	71	66	0	1
Utah [2]			4		438	5	0	1
Pacific States								
Washington	3	4			121	43	0	0
Oregon [5]		1	43	44	142	76	0	0
California	36	49	35	55	688	1,220	2	1
Total	657	615	1,712	1,317	33,002	17,495	58	75

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr. 15, 1933
New England States								
Maine	0	0	30	24	0	0	3	1
New Hampshire	0	0	6	20	0	0	0	0
Vermont	0	0	8	14	0	0	0	0
Massachusetts	0	0	302	375	0	0	1	2
Rhode Island	0	0	12	28	0	0	0	0
Connecticut	0	0	64	140	0	0	1	0
Middle Atlantic States:								
New York	1	2	739	1,085	0	0	8	7
New Jersey	0	2	218	223	0	0	0	0
Pennsylvania	1	1	774	1,141	0	0	14	3
East North Central States								
Ohio	1	3	981	1,098	1	5	2	9
Indiana	0	1	210	188	1	0	12	3
Illinois	2	2	570	540	5	8	6	6
Michigan	0	0	904	617	0	2	1	7
Wisconsin	1	1	216	148	22	8	0	9
West North Central States.								
Minnesota	0	0	69	89	6	0	0	0
Iowa [2]	0	0	58	34	1	30	0	1
Missouri	0	0	80	81	7	0	3	0
North Dakota	0	0	67	8	0	0	1	0
South Dakota	0	0	11	36	15	0	0	5
Nebraska	1	0	28	20	18	2	0	2
Kansas	0	0	95	49	3	3	1	1
South Atlantic States:								
Delaware	0	0	8	14	0	0	2	1
Maryland [2 3]	0	0	91	103	0	0	2	3
District of Columbia	0	0	14	15	0	0	2	0
Virginia	0	0	35	42	0	0	3	1
West Virginia	0	0	72	12	0	0	3	5
North Carolina	2	0	22	59	1	0	0	15
South Carolina	0	2	4	4	1	0	5	5
Georgia [3]	0	0	15	10	0	0	8	5
Florida	0	0	6	1	0	0	1	2

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr 14, 1934, and Apr 15, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr 15, 1933	Week ended Apr 14, 1934	Week ended Apr 15, 1933
East South Central States								
Kentucky	0	0	46	36	1	0	4	3
Tennessee	1	1	31	36	0	0	3	3
Alabama [3]	0	1	6	5	0	1	8	4
Mississippi	0	0	6	6	6	0	2	7
West South Central States								
Arkansas	0	0	4	4	3	2	2	1
Louisiana	0	0	17	7	0	0	13	6
Oklahoma [4]	0	0	7	21	1	2	8	0
Texas [3]	1	1	86	64	24	20	10	9
Mountain States								
Montana	0	0	5	9	1	0	0	1
Idaho [5]	1	0	2	5	2	1	0	0
Wyoming [5]	0	0	5	5	7	0	0	1
Colorado [5]	0	1	27	20	6	0	1	0
New Mexico	0	0	9	11	0	3	1	0
Arizona	0	0	15	7	0	0	0	0
Utah [2]	0	0	10	6	2	0	0	1
Pacific States								
Washington	1	3	50	36	5	8	2	2
Oregon [5]	1	0	26	22	4	4	3	1
California	6	3	212	157	1	32	6	3
Total	20	24	6,273	6,675	144	131	142	126

[1] New York City only
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended Apr 14, 1934, 21 cases, as follows Maryland, 1, Georgia, 9, Alabama, 2, Texas, 9
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended Apr 14, 1934, 10 cases, as follows Idaho, 1, Wyoming, 2, Colorado, 1; Oregon, 6

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1934										
Arizona		4	121	1	261	1	2	109	2	5
Maryland	2	32	112	4	4,077	1	1	393	0	17
New York	21	207		6	5,616		1	3,931	0	37
North Dakota	3	17	56		504		2	126	5	1
Oregon		4	344	2	388		0	141	32	5
Vermont		4			308		0		0	2

March 1934

	Cases
Botulism	
Oregon	2
Chicken pox	
Arizona	110
Maryland	646
New York	3,347
North Dakota	95
Oregon	203
Vermont	88
Conjunctivitis	
Arizona	2
Diarrhea	
Maryland	3
Dysentery	
Arizona	12
Maryland	8
New York (amoebic)	17
New York (bacillary)	15
German measles	
Arizona	192
Maryland	246
New York	143
Impetigo contagiosa	
Maryland	14
Oregon	33
Lethargic encephalitis	
Arizona	2
Maryland	4
New York	7
Oregon	2
Mumps	
Arizona	26
Maryland	255
North Dakota	24
Oregon	27
Vermont	24
Ophthalmia neonatorum	
Maryland	1
New York	5
Paratyphoid fever	
New York	3
Oregon	1
Psittacosis	
New York	1
Puerperal septicemia	
Oregon	1
Rabies in animals	
Maryland	2
New York [1]	4
Vermont	1
Rocky Mountain spotted fever	
Oregon	10
Scabies	
Arizona	11
Oregon	36
Septic sore throat	
New York	60
North Dakota	1
Oregon	4
Tetanus	
New York	4
Trachoma	
Arizona	62
North Dakota	2
Oregon	8
Trichinosis	
Maryland	1
New York	30
Tularaemia	
New York	1
Typhus fever	
New York	2
Undulant fever	
Arizona	1
Maryland	1
New York	39
North Dakota	1
Vermont	2
Vincent's infection	
Maryland	23
New York [1]	104
North Dakota	10
Oregon	5
Whooping cough	
Arizona	238
Maryland	1,050
New York	1,810
North Dakota	39
Oregon	205
Vermont	227

[1] Exclusive of New York City

CASES OF VENEREAL DISEASES REPORTED FOR FEBRUARY 1934

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases The figures are taken from reports received from State health officers They are preliminary and are, therefore, subject to correction It is hoped that the publication of these reports will stimulate more complete reporting of these diseases

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama [1]				
Arizona	28	0.62	82	1.81
Arkansas [2]	6	.03	17	.09
California	1,523	2.51	993	1.64
Colorado [3]				
Connecticut [2]	149	.91	98	.60
Delaware	94	3.90	27	1.12
District of Columbia	111	2.24	74	1.49
Florida [1]				
Georgia	471	1.62	299	1.03
Idaho	0			
Illinois	1,351	1.73	1,136	1.45
Indiana	192	.58	102	.31
Iowa [2]	132	.53	145	.58
Kansas	140	.74	82	.43
Kentucky	194	.73	281	1.06
Louisiana	138	.64	92	.43
Maine	31	.39	29	.36
Maryland	517	3.11	200	1.20
Massachusetts	350	.81	416	.96
Michigan	386	.77	363	.72
Minnesota	306	1.18	256	.99
Mississippi	917	4.48	1,484	7.25
Missouri [3]				
Montana [2]	27	.50	24	.45
Nebraska	36	.26	79	.57
Nevada [3]				
New Hampshire	10	.21	16	.34
New Jersey	524	1.25	240	.57
New Mexico [2]	50	1.15	34	.78
New York	4,494	3.47	1,153	.89
North Carolina	1,009	3.08	376	1.15
North Dakota	42	.61	53	.77

[1] Have been reporting regularly but no report received for current month.
[2] Incomplete
[3] Not reporting.

Cases of venereal diseases reported for February 1934—Continued

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Ohio [1]	628	0 92	263	0 39
Oklahoma [2]	128	52	134	54
Oregon	109	1 11	70	.71
Pennsylvania	229	23	176	18
Rhode Island	86	1 23	52	74
South Carolina [2]	422	2 41	514	2 94
South Dakota	10	14	23	33
Tennessee [2]	603	2 26	230	86
Texas [1]				
Utah [3]				
Vermont	21	58	21	58
Virginia [2]	290	1 19	199	82
Washington	173	1 08	202	1 26
West Virginia [1]				
Wisconsin [4]	43	14	173	.58
Wyoming	6	26	10	.43
Total	15,976	1 47	10,218	94

[1] Have been reporting regularly but no report received for current month
[3] Incomplete
[4] Only cases of syphilis in the infectious stage are reported

NOTE —Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6 6 for syphilis and 10 2 for gonorrhea

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr. 7, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0		0	1	1	6	0	0	0	6	26
New Hampshire:											
Concored	0		0	24	1	0	0	0	0	1	11
Manchester	0		0	0	1	0	0	1	0	0	18
Nashua	0		0	9	0	0	0	0	0	0	
Vermont:											
Barre	0		0	0	0	0	0	1	0	0	3
Burlington	0		0	0	0	3	0	0	0	8	6
Massachusetts											
Boston	7	1	3	419	24	40	0	10	1	74	256
Fall River	2		0	1	4	6	0	0	0	6	43
Springfield	0		0	4	3	5	0	0	0	4	45
Worcester	0		0	4	4	0	0	2	0	8	51
Rhode Island											
Pawtucket	0		0	0	0	0	0	0	0	0	19
Providence	0		0	12	5	1	0	2	0	13	67
Connecticut											
Bridgeport	0		0	1	0	18	0	1	0	4	28
Hartford	0		0	0	8	5	0	3	0	0	54
New Haven	0		1	1	1	2	0	0	0	1	32
New York											
Buffalo	3		0	169	24	20	0	10	0	27	143
New York	55	26	11	122	195	312	0	83	2	98	1,588
Rochester	1	1	0	4	3	51	0	0	1	11	70
Syracuse	0		0	18	6	4	0	2	0	34	65
New Jersey:											
Camden	2		0	99	3	8	0	1	0	0	40
Newark	0	5	1	7	9	16	0	8	0	45	112
Trenton	1	2	0	64	3	22	0	1	0	7	48
Pennsylvania:											
Philadelphia	8	3	2	1,050	46	119	0	31	2	73	603
Pittsburgh	10	7	4	195	35	28	0	6	1	42	192
Reading	2		0	1	0	5	0	2	0	8	24
Scranton	0		0	0	0	3	0	0	0	0	

City reports for week ended Apr. 7, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Ohio											
Cincinnati	5	------	1	18	27	42	0	14	0	12	167
Cleveland	4	34	3	75	31	125	0	16	0	121	234
Columbus	1	1	1	2	6	48	0	4	0	28	81
Toledo	1	------	0	75	7	25	0	8	0	119	77
Indiana											
Fort Wayne	8	------	0	45	0	13	0	0	3	4	23
Indianapolis	1	------	0	195	11	34	0	8	0	41	------
South Bend	0	------	0	0	1	9	0	2	0	0	17
Terre Haute	0	------	0	1	2	4	0	0	0	3	21
Illinois											
Chicago	3	2	5	267	72	232	0	38	1	192	784
Cicero	0	------	0	0	0	0	0	0	0	0	9
Springfield	0	------	0	177	4	1	0	0	0	24	17
Michigan											
Detroit	8	1	1	92	34	155	0	13	0	91	295
Flint	2	------	0	7	5	79	0	2	0	11	25
Grand Rapids	0	------	0	1	5	26	0	0	0	2	33
Wisconsin											
Kenosha	0	------	0	5	0	12	0	0	0	3	5
Madison	0	------	------	3	------	6	[1] 1	------	0	32	22
Milwaukee	0	------	0	15	8	69	0	0	0	87	109
Racine	1	------	0	3	1	5	3	0	0	1	13
Superior	0	------	0	0	1	8	0	1	0	0	12
Minnesota											
Duluth	0	------	0	0	1	1	0	1	0	0	25
Minneapolis	2	------	0	11	6	13	0	0	1	48	117
St Paul	0	------	0	7	13	13	0	1	0	32	63
Iowa											
Des Moines	4	------	------	0	------	18	0	------	0	0	39
Sioux City	2	------	------	4	------	0	0	------	0	2	------
Waterloo	0	------	------	0	------	2	0	------	0	31	------
Missouri											
Kansas City	------	------	------	------	------	------	------	------	------	------	------
St Joseph	2	------	0	10	6	1	0	0	0	1	21
St Louis	25	------	------	78	13	37	1	11	2	76	257
North Dakota											
Fargo	0	------	0	37	2	0	0	0	0	7	12
Grand Forks	0	------	------	0	------	1	0	------	0	3	------
South Dakota											
Aberdeen	0	------	------	44	------	0	0	------	0	12	------
Sioux Falls	0	------	------	6	------	0	0	------	0	0	------
Nebraska											
Omaha	1	------	0	157	5	11	1	4	0	14	57
Kansas											
Topeka	0	------	1	5	0	2	0	0	2	36	7
Wichita	0	------	0	28	4	1	0	1	0	20	21
Delaware:											
Wilmington	1	------	0	88	8	1	0	1	2	0	41
Maryland:											
Baltimore	5	6	3	1,136	38	28	0	14	1	183	269
Cumberland	0	------	0	0	2	1	0	0	0	2	9
Frederick	------	------	------	------	------	------	------	------	------	------	------
District of Col:											
Washington	6	2	1	375	19	7	0	12	0	22	172
Virginia											
Lynchburg	0	------	0	1	1	2	0	0	0	11	13
Norfolk	1	------	0	73	5	1	0	1	0	0	39
Richmond	0	------	2	225	3	6	0	6	1	0	59
Roanoke	0	------	0	3	2	1	0	2	0	4	34
West Virginia:											
Charleston	0	------	0	0	1	0	0	0	0	0	9
Huntington	1	------	0	1	------	15	0	------	0	0	------
Wheeling	0	------	0	2	2	8	0	0	0	3	16
North Carolina:											
Raleigh	0	------	0	9	0	0	0	0	0	19	15
Wilmington	0	------	0	2	1	0	0	0	0	4	9
Winston-Salem	1	1	0	35	2	4	0	0	0	0	12
South Carolina.											
Charleston	0	21	0	43	2	3	0	4	2	6	23
Columbia	0	------	0	0	3	0	0	0	0	0	37
Greenville	0	------	0	1	8	0	0	0	1	1	24
Georgia:											
Atlanta	1	2	1	92	11	2	0	3	0	5	78
Brunswick	0	------	0	45	0	0	0	0	2	0	3
Savannah	0	3	1	22	1	1	0	1	1	0	28
Florida:											
Miami	2	------	0	71	3	0	0	0	0	7	30
Tampa	2	1	0	143	1	0	0	4	0	0	32

[1] Nonresident.

City reports for week ended Apr. 7, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Kentucky											
Ashland	1	-	-	23	-	0	0	-	0	1	-
Lexington	0	-	0	14	3	2	0	2	0	9	18
Louisville	2	-	0	13	13	25	0	3	0	43	81
Tennessee											
Memphis	1	-	3	169	16	5	0	12	0	4	93
Nashville	0	-	1	15	4	4	0	1	0	11	43
Alabama											
Birmingham	1	5	3	41	4	4	0	2	0	5	79
Mobile	0	-	0	8	1	0	0	0	1	0	21
Montgomery	4	1	-	174	-	0	0	-	0	5	-
Arkansas											
Fort Smith	1	-	-	5	-	2	0	-	0	1	-
Little Rock	0	-	0	32	6	1	0	1	0	2	8
Louisiana											
New Orleans	12	9	2	34	7	20	0	13	1	1	119
Shreveport	1	-	0	20	6	4	0	0	0	0	49
Oklahoma											
Oklahoma City	0	16	0	24	16	2	0	1	0	6	50
Tulsa	0	-	-	12	-	0	0	-	0	2	-
Texas											
Dallas	9	2	2	1	9	3	2	1	1	1	58
Fort Worth	1	-	0	10	9	6	0	1	0	2	34
Galveston	1	-	0	0	1	1	0	0	0	0	9
Houston	7	-	1	5	5	4	3	8	0	0	78
San Antonio	3	-	2	0	3	3	0	4	0	0	49
Montana:											
Billings	0	-	0	0	0	0	0	0	0	3	5
Great Falls	0	-	0	10	3	0	0	0	0	2	7
Helena	0	-	0	1	0	0	0	0	0	0	1
Missoula	0	-	0	0	1	0	0	0	0	0	3
Idaho											
Boise	0	-	0	4	0	3	1	1	0	0	5
Colorado:											
Denver	1	49	5	121	3	10	0	6	0	101	62
Pueblo	0	-	0	17	0	5	0	0	0	29	8
New Mexico:											
Albuquerque	0	-	0	14	0	3	0	4	0	2	15
Utah											
Salt Lake City	0	-	0	157	2	7	0	2	0	35	33
Nevada											
Reno	0	-	0	1	0	0	0	0	0	0	5
Washington.											
Seattle	0	-	-	2	5	20	1	6	1	93	83
Spokane	0	1	1	24	4	5	0	1	0	12	32
Tacoma	0	-	0	56	0	0	0	0	0	17	30
Oregon:											
Portland	0	-	1	8	1	7	1	0	0	13	63
Salem	0	2	0	0	0	0	0	0	0	1	-
California											
Los Angeles	26	17	1	58	22	40	0	21	0	57	300
Sacramento	0	-	0	10	5	3	0	4	2	3	32
San Francisco	1	1	2	132	8	8	0	7	3	18	139

[1] Nonresident.

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts				Minnesota.			
Boston	0	1	0	Duluth	0	1	0
Connecticut.				Iowa			
New Haven	1	0	0	Des Moines	1	0	0
New York:				Missouri			
New York	3	2	3	St Joseph	0	1	0
Pennsylvania:				St Louis	1	0	0
Philadelphia	1	0	0	Tennessee			
Ohio:				Memphis	1	1	0
Cleveland	1	0	0	Arkansas			
Columbus	1	1	0	Fort Smith	2	0	0
Indiana:				Texas:			
Indianapolis	1	0	0	Dallas	1	1	0
Illinois:				California			
Chicago	11	5	0	Los Angeles	1	1	2

Lethargic encephalitis.—Cases. Boston, 1; New York, 2; Chicago, 1, St. Louis, 1; Atlanta, 1.
Pellagra.—Cases: Boston, 1; Washington, 1; Charleston, S.C., 1; Tokepa, 1; Birmingham, 1; San Francisco, 1.
Typhus fever.—Cases: Atlanta, 1; Mobile, 1

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—2 weeks ended April 7, 1934.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended April 7, 1934, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	3	Measles	248
Chicken pox	118	Ophthalmia neonatorum	3
Diphtheria	27	Puerperal septicemia	4
Dysentery	1	Scarlet fever	136
Erysipelas	16	Tuberculosis	96
German measles	27	Typhoid fever	54
Influenza	1	Undulant fever	1
Lethargic encephalitis	1	Whooping cough	213

CUBA

Provinces—Notifiable diseases—4 weeks ended February 24, 1934.—During the 4 weeks ended February 24, 1934, cases of certain notifiable diseases were reported in the provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1	3	3	10		2	19
Chicken pox			4	5	4		13
Diphtheria		9	5	5	2		21
Hookworm disease		1		2			3
Leprosy				3			3
Malaria	139	20	244	1,167	59	990	2,619
Measles	1	2		2		4	9
Tetanus, infantile				1			1
Tuberculosis	7	16	36	60	18	66	203
Typhoid fever	3	3	4	20	4	9	43

PUERTO RICO

Notifiable diseases—4 weeks ended March 24, 1934.—During the 4 weeks ended March 24, 1934, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico, as follows:

Disease	Cases	Disease	Cases
Chicken pox	204	Pellagra	10
Diphtheria	41	Puerperal fever	1
Dysentery	49	Ringworm	8
Erysipelas	1	Syphilis	4
Filariasis	4	Tetanus	7
Influenza	58	Tetanus, infantile	4
Malaria	[1] 15,006	Trachoma	32
Measles	71	Tuberculosis	511
Mumps	50	Typhoid fever	10
Ophthalmia neonatorum	6	Whooping cough	343

[1] Includes results from a special survey

YUGOSLAVIA

Communicable diseases—February 1934.—During the month of February 1934 certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	16	3	Poliomyelitis	3	2
Cerebrospinal meningitis	12	4	Scarlet fever	248	18
Diphtheria and croup	744	108	Sepsis	10	3
Dysentery	15	3	Tetanus	7	2
Erysipelas	151	12	Typhoid fever	152	24
Measles	1,216	21	Typhus fever	357	36
Paratyphoid fever	13				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given

CHOLERA

[C indicates cases, D, deaths, P, present]

Place		Aug 27–Sept 30, 1933	Oct 1–28, 1933	Oct 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Week ended— January 1934, 6	13	20	27	February 1934, 3	10	17	24	March 1934, 3	10	17	24	31	Apr 7, 1934
China: Hankow	C	1																	
India	C	14,422	9,939	7,571	8,161	978	1,417	1,049	1,014	1,036	956	1,153							
	D	6,654	4,846	3,923	3,799	503	815	519	602	476	492	510							
Bombay Presidency	C	3,111	1,376	1,100	1,204	138	109	78	109	78	37	59	89	42					
	D	1,412	634	594	639	65	59	40	67	42	22	29	35	27					
Bombay	C	5	4	1	4	1													3
Calcutta	C	93	68	55	63	15	14	29	20	37	16	41	32	40	40	108			
Chittagong	C		1		4		2								3	1			
Madras Presidency	C	1,058	727	1,039	2,708	490	282	362	210	165		334							
	D	444	292	453	1,012	206	112	130	104	54		131							
Madras	C		4	6	121	4	4	6	2		6	9			2	1	1		
	D		1	4	56	2	2		2		1	5			1		1		
Rangoon	C														1				
Vizagapatam	C		1																
India (French).																			
Chandernagor	D	2										2							
Karikal	C	1			2		1	2	2										
India (Portuguese)	C					1											1		
Indo-China (see also table below) Rachgia	C																		
Philippine Islands [1]																			
Antique Province	C		17	8	8														
	D		16	6	6														
Bohol Province	C	6	87	173	140	78	63	93	58	30	29	66	95	62	49	13	12	3	2
	D	3	47	101	94	59	37	66	38	21	19	41	61	41	26	7	6	4	2
Cebu Province	C	39	63	71	75	12	12	6	4	1								1	
	D	28	36	45	54	8	12	7	3	1								1	
Cebu	C	9	21	17				1		1									
	D	7	8	8				1		1									
Naga	C			18	4		2												
	D			9	3		1												

[1] No cholera was reported in the Philippine Islands for the week ended Apr. 14, 1934.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

CHOLERA—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug 27–Sept. 30, 1933	Oct 1–28, 1933	Oct 29–Nov. 25, 1933	Nov. 26–Dec. 30, 1933	Week ended— January 1934: 6	13	20	27	February 1934: 3	10	17	24	March 1934: 3	10	17	24	31	Apr 7, 1934
Philippine Islands—Continued																			
Iloilo Province	C		12	2			1												
	D		11	3			1												
Iloilo	C			2															
	D			8															
Leyte Province	C	1																	
	D	1																	
Occidental Misamis Province	C	1											1						
	D	1																	
Occidental Negros Province	C				9	8		9	10		7	5	1			2	34	12	3
	D				6	5		10	8		4	6	1			1	19	11	3
Oriental Negros Province	C				6	23	21	37	15	13	4	27	3	12	13	5	2	1	
	D				6	14	9	21	8	10	2	19	3	7	6	5	5	1	
Samar Province	C	[2] 32	[3] 20													18			
	D	[2] 20	[3] 14													18			
Siam	C									1									
Bangkok	C												1						

[2] For 2 weeks

[3] For the month of October

Place		August 1933: 1–10	11–20	21–31	September 1933: 1–10	11–20	21–30	October 1933: 1–10	11–20	21–31	November 1933: 1–10	11–20	21–30	December 1933: 1–10	11–20	21–31	January 1934: 1–10	11–20
Indo-China (French) (see also table above)																		
Cambodia [1]	C		1															2
	D		1															1
Cochin-China [1]	C	3	2	1	1	2	2	5	5					2	1	1		1
	D	3	2	1	1	2	2	5	3					2	1	1		1

[1] Reports incomplete.

PLAGUE[1]

[C indicates cases, D, deaths. P, present]

Place		Aug 27–Sept 30, 1933	Oct 1–28, 1933	Oct 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Week ended— January 1934				February 1934				March 1934				
						6	13	20	27	3	10	17	24	3	10	17	24	31
Angola [2]																		
Argentina (see also table below) Buenos Aires Province	C									1								
	D									1	1							
Azores[4]																		
Fayal	C	1																
Ponta Delgada	C						[3] 3		[4] 1									
	D						[3] 1											
St. Michaels	C	7																
Bolivia. (See table below)																		
British East Africa (see also table below).																		
Kenya	C	30	18	37	21	5		9	5	2	1	4						
Tanganyika	D			1											4			
Uganda	C	113	63	81	77	13	16	5	10	8	6	7	6					
	D	109	61	79	72	12	16	5	9	8	6	7	6					
Ceylon· Colombo	C	1	1		1				1			1	2	1		2	3	
	D	1	1		1				1			1	1	1		2	3	
Plague infected rats					1			1	2	3			1		1			
China. Manchuria [5]																		
Dutch East Indies. West Java	C	1,465	[4] 816	1,568	1,671	529	545	453										
	D	1,463	[4] 814	1,560	1,576	529	545	453										
Ecuador. (See table below)																		
Egypt																		
Alexandria	C				1													
Asyut	C							1		2	1	1					1	2
Faiyum	C	2	1					1							1			
Gharbiya	C	3	2					1										
	D	2	3					1										
Girga	C										3							
Minya	C	1																

[1] Including plague in the United States and its possessions
[2] During December 1933 and January 1934, 32 cases of plague with 17 deaths were reported in Angola
[3] For 3 weeks.
[4] For 2 weeks.
[5] A report dated Nov. 13, 1933, states that plague was reported in Manchuria, China, as follows Fengtien Province, 249 cases, Hsingan Province, 200 cases, Jehol Province, 81 cases; Kirin Province, 479 cases.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE[1]—Continued

[C indicates cases; D, deaths, P, present]

Place		Aug. 27–Sept 30, 1933	Oct 1–28, 1933	Oct 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Week ended— January 1934 6	13	20	27	February 1934 3	10	17	24	March 1934 3	10	17	24	31
France. Marseille—Plague-infected rats				1														
Hawaii Territory Hawaii Island—Hamakua—Plague-infected rats		1		2	5		1											
India	C	13,642	11,755	11,037	12,687	4,196	4,054	3,907	4,734	3,929	4,645	4,307						
	D	7,971	6,430	5,921	7,338	2,760	2,594	2,431	3,130	2,528	3,143	2,867						
Bassein	C	3			1	2	2	1					3	3	3	3	1	
Plague-infected rats					2								1	1	2			
Bombay Presidency	C	8,069	4,922	5,799	5,501	1,328	1,181	1,274	1,123	1,127	1,225	1,340	1,179	841				
	D	5,117	2,928	3,621	3,555	856	860	761	758	719	783	865	744	573				
Bombay	C	7	3	1	1		1			5	6	5	1	1	1	1	2	
Plague-infected rats		3	1	8	1					2	2	4	1	2	4	10		
Poona	C		475	61														
	D		527	53														
Calcutta	C				1[6]													
	D				1[6]													
Madras Presidency	C	1,181	521	537	676	255	248	213	165	209		147						
	D	547	294	257	317	139	126	142	90	110		83						
Rangoon	C	2	1	1						3	1	3					1	
Plague-infected rats		2		2	3	1					1	2	1	3	1			
India, Portuguese—Colem	C									2								
Indo-China (see also table below).																		
Pnom-Penh	D	2	2		1			1		1								2
Saigon and Cholon	C						1											1
Iraq Baghdad	C	3	1	2	5		1			1	1				1			
Libya	C	10			11				2									
	D	3			6				1									
Madagascar. (See table below)																		
Peru (See table below)																		
Portuguese West Africa	C										P							
Senegal. (See table below.)																		
Siam	C									3					1	1		
South-West Africa[7]																		
Union of South Africa																		
Cape Province	C			18	3													
Orange Free State	C				1				13									
Transvaal	C				1													

United States. California [8]—Santa Clara County—Plague-infected ground squirrels					1													
On vessel: S S Angkor at Beirut from Marseille	C		1															

[6] Imported

[7] 116 cases of plague with 5 deaths were reported in Ovamboland, South-West Africa, from Jan 1 to Dec 2, 1933 Antiplague measures have been taken

[8] Plague has been reported in ground squirrels in Kern and Tulare Counties, Calif, 10 to 18 miles east of Delano, Calif Twenty-one lots of plague-infected squirrels have been reported.

Place		September 1933	October 1933	November 1933	December 1933	January 1934	February 1934
Argentina (see also table above)	C		6	4			
	D		2	1			
Bolivia	C			5			
British East Africa (see also table above)							
Kenya	C	26	20	36	14	19	
Uganda	C	97	71	83	63	49	
Ecuador	C	3					
Indo-China (see also table above)							
Cambodia	D	16	8	2	1	2	4
Cochin-China	C	1			1	1	1
Madagascar	C	77				249	
	D	73				236	
Peru	C	8	18	19	12	7	6
Callao	C	1	7				
Senegal							
Dakar [9]	C	5	4	15	3	1	2
	D	3	9	10	3	1	2
Medina [9]	C		1	1	1		
	D		1	1	1		
Tivaouane [9]	C	2					

[9] Reports incomplete.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX

[C indicates cases, D, deaths, P, present]

Place		Aug. 27–Sept 30, 1933	Oct 1–28, 1933	Oct 29–Nov 25, 1933	Nov. 26–Dec 30, 1933	Week ended— January 1934: 6	13	20	27	February 1934: 3	10	17	24	March 1934: 3	10	17	24	31	Apr. 7, 1934
Algeria																			
Algiers Department	C			1					2		1					2			
Constantine Department	C								1										
Angola. (See table below)																			
Arabia (See table below)																			
Belgian Congo (see also table below)	C	4				4													
Bolivia. (See table below)																			
Brazil:																			
Porto Alegre (alastrim)	C	12	5	1	1	1													
Santos	C				4		2												
British East Africa																			
Kenya	C						1	1	65	7	13	722		12					
Tanganyika	C	30	52	202	71	20	13		6	16		15	19		19				
British Somaliland	C						8	7	3	9	3	1		7					
British South Africa.																			
Northern Rhodesia	C		16		116				1										
Southern Rhodesia	C	2							1			1							
Canada.																			
Alberta	C				1														
British Columbia	C																1		[1] 1
Ontario	C			1					[2] 1										
Prince Edward Island	C				[2] 1														
Quebec	C				1		1												
Saskatchewan	C	1																	
Ceylon Colombo	C			1															
China.																			
Amoy	C						1	1											
Canton	C			2	6	5	5	3	1		1	4	2	9	9	6	5		
Dairen	C	1	3	17	127	24	44			100	39	19	12	14					
Hangchow	C			1	2		2				1		3	2	4				
Hankow	C	3			2										1				
Hong Kong	C			1	2			1	2	2		5	9	13	7	5	24		5
Kwangtung Leased Territory	C								38	51		22	17	11					
Macao	C											3	1	2	2	3			
Manchuria—Mukden.[3]																			
Nanking	C				1					1	1	2			1				

Shanghai	C	5	3	17	57	12	29	27	40	29	26	30	28	43	35	35	49	11	
South Manchuria Railway Zone	C								58	57		16	26	7					
Swatow	C		2	1			1						1	1					
Tientsin	C				1						1			2					
Costa Rica (See table below)																			
Dahomey (See table below)																			
Ecuador. (See table below)																			
Egypt																			
Alexandria	C			3		1	1	1	2	1			2						
Aswan	C						7	3	24		19		5	7		5			
Asyut	C	43	40	7	30		3		4				1	2					
Beni-Suef	C	31	13																
Cairo	C	1			1								1		1	1			
Dakahliya	C				87		7	1	4										
Faiyum	C	3	1	13	3														
Gharbiya	C	5	2	7	8									5		2			
Girga	C		9		20		6	3	8		5		3	5		4			
Minya	C				32		48	71	53		68		37	17		30			
Qena	C	4	25	28	24		5		1		5								
Provinces	C	150	95	168	265	117	77	79	96	108	103		54		31	42			
Eritrea: Asmara	C															[1]1			
Gold Coast	C														P				
Great Britain																			
England and Wales	C	20	10	9	27	3	13	7	9	8	16	20	23	11	5	11	5		
Blackburn	C								1			13	7	2	1	1			
	D									1			[2]3						
London	C	14	10	9	27	3	13	7	8	8	16	16	15	9	4	10	5		
London and Great Towns	C	15	10	9	27	3	13	7	9	8	16	19	23	11	5	11	5		
Greece (see also table below) Salonika	C	9									3	3	3	3					
India	C	7,052	4,699	5,677	10,824	2,053	3,150	2,781	4,170	3,837	5,564	5,313							
	D	1,625	1,079	1,232	2,707	507	718	569	1,143	918	1,149	1,313							
Bassein	C	19	12	12	33	9	11	24	18	23	17	13	17	11	6	2	10		
	D	6	7	6	11	8	3	7	8	3	8	6	4	4	4	5	5		
Bombay Presidency	C	873	599	673	1,385	411	293	410	477	448	537	777	803	809					
	D	160	91	115	286	74	59	94	109	90	95	127	158	123					
Bombay	C	1	4	4	20	4	6	8	13	26	11	8	11	10	9	14	12		
	D	1	4	3	13	1	2	4	4	7	7	5	5	5	6	6	6		
Calcutta	C	10	8	13	75	31	42	46	62	80	100	105	81	76	55	76			
	D	3	3	5	42	20	24	34	37	48	58	78	61	56	42	46			
Cochin	C	2	1				5	6	1	5	4	1	1	1	3	5	6		
Karachi	C		2	1	[4]4	3	4	4	4	3	4	8	6	14	8	6	3		
Madras Presidency	C	2,944	2,432	2,479	2,297	660	857	1,300	1,045	1,191		1,286							
	D	513	507	447	372	133	149	182	247	197		297							
Madras	C	209	81	41	83	20	22	51	20	24	23	27	21	16	20	23	33		
Negapatam	C	8	9	17	20			3	1							2			
Rangoon	C	4	1	2	9	4	5	1	4	8	2	9	9	2	6	9	12		
Tuticorin	C		1	6				4			6						1		
Vizagapatam	C	2	1	2	3		1	1	2	1	5	6	1	5	1	5	7		

[1] Imported.
[2] For 2 weeks
[3] From Jan. 1, 1934, to Feb. 9, 1934, 140 cases of smallpox with 17 deaths were reported in Mukden, Manchuria, China.
[4] Includes 1 imported case.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases; D, deaths, P, present]

Place		Aug 27–Sept. 30, 1933	Oct 1–28, 1933	Oct 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Week ended— January 1934: 6	13	20	27	February 1934: 3	10	17	24	March 1934: 3	10	17	24	31	Apr 7, 1934
India (French):																			
Chandernagor	D					1	1	2			1	1							
Karikal	C	1	1	3	11	1		1				1	1	1					
	D	1	1	3	6	1		1						1					
Pondichery	C	210	101	71	93	24	28	8	16	28	32	36	26	37					
	D	104	63	32	50	11	15	8	9	11	18	16	14	25					
Indo-China (see also table below)																			
Halphong	C					34	20	23	37	31	5	41	34	19	22	12	8	5	
Saigon and Cholon	C	1			1														
Iraq	C	8	33	135	34	10	7			17					8				
Amara Liwa	C							19											
Baghdad	C		2	3	3	1		1		1	1	1		2	1				1
Basra	C	4		3	1														
Japan.																			
Osaka	C											1		1	1			1	
Tokyo	C							1									3		
Yokohama	C									2									
Lithuania. (See table below)																			
Mexico (see also table below)																			
Chihuahua	D										1								
Guadalajara	D										1								
Juarez [5]																			
Mexico, D.F.	C						1	1									12		
Monterrey	D			1	1							1							
Saltillo	D				2														
San Luis Potosi	D						1												
Tampico	C					1	1												
Torreon	D	1	2																
Vera Cruz	C		1	1											1 1				
Morocco (See table below)																			
Nigeria	C	113	166	509	184	39				159		778							
Lagos	C						7			1	2	3	9	3					
Nyasaland (See table below.)																			
Palestine	C													10	2	5			

Persia	C	20	45	12	25														
	D	11	5	5	2														
Teheran	C	3	11	8	3	4	1	2	1	5	1	2	2						
	D	1	4	2	2	3		1	1	3		1	2						
Peru. (See table below):																			
Poland	C		1	1										1					
Portugal (see also table below)																			
Lisbon	C	3		1		4		1		2		1	1		1	1			
Oporto	C		2	2							2								
Siam	C								1									4	
Sierra Leone	C	250	534	578	260	[2] 70		[2] 73		[2] 162		[2] 27		[2] 76					
Spain	C	16	11	40		3	7	8	5		3	6		6	8	6			
Sudan (Anglo-Egyptian)	C	1		15	61	17		8	9	13	41	6	6	14	25	6	40	5	
Syria																			
Beirut	C				20	12	20	19	10	12	8	13	12	7				1	
Provinces	C	7	34	35	44	11	30	30	30	8	14	12	4			12	6	11	
Turkey (See table below)																			
On vessels:																			
S.S. Clan Macquarrie at Suez	C	1																	
S.S. Lichtenfels at Suez from Calcutta	C	1																	
S.S. Shahjehan at Madras	C	1																	
S.S. Rohna at Penang from Madras	C			1															
S.S. Enterprise at Karachi	C				1														
S.S. Jaldurga at Rangoon from Gogalpore	C				1														
S.S. Pembrokeshire at Hong Kong	C				P														
S.S. Cremer at Singapore from Penang and Belawan	D				1														
S.S. Jufuku Maru at Chefoo from Dairen	C						P												
S.S. Haiching at Amoy	C							P											
S.S. Elysia at Suez from Bombay	C									1									
S.S. Red Sea at Colombo from Singapore	C									[6] 2									
S.S. King City at Victoria	C													2					
S.S. Ranpura at Bombay from Shanghai	C														1				

[1] Imported

[2] For 2 weeks

[3] Dec 18, 1933: 90 cases of smallpox were reported in Juarez, Mexico, with 18 deaths occurring from Dec 1 to 16, 1933

[6] Includes one suspected case.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths, P, present]

Place		September 1933	October 1933			November 1933			December 1933			January 1934			February 1934
			1-10	11-20	21-31	1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10
Dahomey	C	27	2	8	15	9	9	5							
	D	6		6		6	6								
Indo-China (see also table above)	C	81	39	20	78	24	22	11	54	65	63	92	99	124	113
	D	32	15	5	18	10	8		10	12	7	14	14	27	26

Place		September 1933	October 1933	November 1933	December 1933	January 1934	February 1934
Angola	C	4					
Arabia	C				20		
	D				14		
Belgian Congo (see also table above)	C					126	
Bolivia	C	15	34	39	21		
Costa Rica	C			3			1
Ecuador	C	10				4	
Greece (see also table above)	C		1	2			

Place		September 1933	October 1933	November 1933	December 1933	January 1934	February 1934
Lithuania	C					49	
Mexico (see also table above)	C	18			7		
Morocco	C	2	3	16		1	1
Nyasaland	C	318	289	391	132	130	
Peru	C	90	23	21	25		
Portugal (see also table above)	C	105	214	323	128	111	
	D	27	31	21	16	19	
Turkey	C	56		12	17	23	

TYPHUS FEVER

[C indicates cases, D, deaths, P, present]

Place		Aug 27–Sept. 30, 1933	Oct 1–28, 1933	Oct 29–Nov 25, 1933	Week ended—															
					December 1933					January 1934				February 1934				March 1934		
					2	9	16	23	30	6	13	20	27	3	10	17	24	3	10	17
Algeria.																				
Algiers Department	C	------	1	------	9	------	------	------	------	------	------	------	------	------	------	1	3	------	------	6
Constantine Department	C	16	5	8	1	2	3	------	1	2	6	1	2	5	3	5	9	------	[1] 39	8
Bone	C	------	------	1	------	------	------	------	------	1	1	------	------	------	------	------	------	------	------	------
Philippeville	C	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	1	------	------	------
Oran Department	C	2	1	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------	2	------
Basutoland (See table below.)																				
Bolivia. (See table below.)																				
British East Africa																				
Tanganyika	C	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------	19	------
Uganda	C	11	2	2	------	------	3	------	2	------	------	1	1	------	1	------	------	------	------	------
Bulgaria	C	1	3	3	3	------	------	5	------	7	3	8	7	16	15	11	12	11	3	------
Chile	C	2,558	2,620	2,764	595	612	511	520	476	368	308	------	------	------	------	------	------	------	------	------
Antofagasta	C	------	------	------	------	------	------	------	4	------	------	------	------	------	------	------	------	------	------	------
San Pedro [2]																				
Santiago	C	1,071	1,159	1,211	262	286	200	213	195	156	141	108	127	98	78	61	------	------	------	------
Valparaiso	C	34	43	54	11	8	17	11	11	4	5	2	4	3	4	2	7	5	3	1
China.																				
Hankow	C	1	------	1	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	------
Harbin	C	1	------	------	------	------	------	------	------	------	------	------	------	------	1	------	------	------	------	------
Kwantung Leased Territory	C	------	------	------	------	2	2	------	------	------	------	------	------	------	------	------	------	------	------	------
Nanking	C	------	1	------	------	------	------	------	------	------	------	------	------	------	1	------	------	------	------	------
Shanghai	C	1	1	1	2	------	------	------	1	------	------	------	------	------	------	1	------	------	------	------
South Manchuria Railway Zone	C	------	------	------	------	------	------	------	------	------	------	------	3	------	------	1	2	3	------	------
Chosen (See table below.)																				
Czechoslovakia (See table below.)																				
Egypt																				
Alexandria	C	1	------	------	------	------	------	1	1	------	------	1	3	------	------	------	2	1	7	2
Asyut	C	------	------	1	------	------	1	------	------	------	------	------	------	------	------	------	------	------	------	------
Beheira	C	18	24	43	1	25	28	20	39	------	28	50	72	71	70	------	138	------	180	160
Cairo	C	1	------	------	------	------	------	------	------	------	------	------	------	------	------	------	1	1	4	1
Dakahliya	C	14	------	7	5	------	1	6	2	------	12	26	47	17	36	------	------	32	------	------
Damietta	C	1	------	------	------	------	------	1	------	------	------	------	------	------	------	------	------	1	12	1
Gharbiya	C	41	10	20	14	6	25	16	44	------	64	86	77	78	55	------	36	106	65	132
Girga	C	------	------	------	------	------	------	------	------	------	------	------	4	2	------	------	1	12	1	------

[1] For 2 weeks.
[2] Incomplete reports from San Pedro, Chile, for the month of November 1933 show 113 cases of typhus fever.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases; D, deaths; P, present]

Place		Aug. 27–Sept 30, 1933	Oct 1–28, 1933	Oct 29–Nov 25, 1933	Week ended— December 1933: 2	9	16	23	30	January 1934: 6	13	20	27	February 1934: 3	10	17	24	March 1934: 3	10	17
Egypt—Continued.																				
Minufiya	C	6	12	5		5	6	5	10		8	17	35	56	58		88	94	89	
Qena	C	9	3	6	2															
Provinces	C	107	52	108	27	38	62	49	102	110	116	180	238	226	219	271	284	351	387	431
Greece (See table below.)																				
Guatemala (See table below)															9	1	3	7	1	3
Hungary	C		5	10																
Iraq: Amara	C	1	4																	
Ireland, Northern Londonderry	C								1											
Irish Free State																				
Kerry County—Dingle	C		4	4											1	1				
Killarney	C																			
Roscommon County—Castlerea	C							3												
Japan																				
Aomori Prefecture	C									3		10					2			
Kobe	C		1																	
Osaka	C			1																
Lithuania	C				12	3	9		9	3	9	12	20	21	14	15	8	12	6	4
Mexico (see also table below):																				
Mexico, D.F.	C	16	14	46	6	8	13	19			31	32	20	18	18	24	18			
San Luis Potosi	D	1	1								1									
Torreon	C	2		3																
Morocco (see also table below)	C	2	2			2			5	1	2	1		1	9		12	20	20	10
Palestine	C	3	4	4				2												
Persia	C	24	20	11					3		4	11		4	12	19	30	21	28	
Teheran	C											6	6	2	2	5	4	2	5	
Peru (See table below)																				
Poland	C	51	66	120	51	47	64	93	79	97	99	150	169	161	161	155	161	209	200	179
	D	1	5	10	4	4	4	4	3	6	6	13	9	4	15	11	8	12	19	7
Rumania. (See table below.)																				
Scotland	C																1			
Spain: Madrid	C	2	1																	
Syria	C						15													
Trans-Jordan	C														2	1	5	5	3	3

Tunisia:																				
Tunis	C	1	2								1	1								1
Provinces	C													29		28	42	22	19	13
Turkey (See table below)																				
Union of South Africa (See table below)																				
Yugoslavia (See table below)																				

Place		September 1933	October 1933	November 1933	December 1933	January 1934	February 1934
Basutoland	C	259		366			
Bolivia	C	99	129	39	88		
Chosen	C		3	8	4	3	
Czechoslovakia	C		1	12	14	7	
Greece	C	4	3	5	3	2	
Guatemala	C	5		6	5	29	16
Mexico (see also table above)	C	42			75	94	
Morocco (see also table above)	C	2	2	1	8		30
Peru	C	84	55	341	137		

Place		September 1933	October 1933	November 1933	December 1933	January 1934	February 1934
Rumania	C	13	28	35	180	399	489
Turkey	C	9	20	23	27	32	24
Union of South Africa							
Cape Province	C	141	166		98	109	
Natal	C	43	42			3	
Orange Free State	C	180	183		241	297	
Transvaal	C	103	24		8	11	
Yugoslavia	C	5	38	13	66	298	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases, D, deaths; P, present]

Place		July 30–Aug. 26, 1933	Aug 27–Sept 30, 1933	Oct 1–28, 1933	Week ended— November 1933 4	11	18	25	December 1933 2	9	16	23	30	January 1934 6	13	20	27
Brazil																	
Acre Territory—Rio Branco	C												1				
Amazonas State—Esperanca	C												1				
Ceara State—St Mathew	C	1															
French West Africa:																	
Guinea	C		[1] 1								2			2			
Niger Territory	C	2	3	2													
Gold Coast:																	
Dunkwa	C														1		
Keta	C													1			
N'Kaw Kaw	C								1								
Togoland	C		[1] 1	[1] 1		1											
Ivory Coast: Abengourou	C											1					
Nigeria: Kano	C				1												
Senegal																	
Bakel	C		2	1													
Birkelane	C								2								
	D								1								
Dakar	C						1										
Kaffrine	C			1											1		
Kaolak	C								1							[2] 1	
Podor	C																[2] 1
Sebikotane	C						1			1							

[1] Suspected
[2] Imported

X

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 18

MAY 4 - - - - 1934

IN THIS ISSUE

Intravenous Use of Copper Sulphate in Trachoma Therapy
Mortality in States in 1933, with Data for Recent Years
Deaths in Large Cities During the Week Ended April 14
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D C. - - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

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CONTENTS

Page

Intravenous use of copper sulphate combined with sodium thiosulphate in treatment of trachoma 555

Mortality in certain States during 1933, with comparative data for recent years 559

Court decision on public health 569

Deaths during week ended April 14, 1934

Deaths and death rates for a group of large cities in the United States 570

Death claims reported by insurance companies 570

PREVALENCE OF DISEASE

United States

Current weekly State reports

Reports for weeks ended April 21, 1934, and April 22, 1933 571

Summary of monthly reports from States 573

Plague-infected ground squirrels in Kern and Tulare Counties, Calif. 574

Weekly reports from cities

City reports for week ended April 14, 1934 575

Foreign and insular

Canada—Provinces—Communicable diseases—2 weeks ended April 7, 1934 578

Cuba—Provinces—Notifiable diseases—4 weeks ended March 24, 1934 578

Poland—Vital statistics—1933 579

Virgin Islands—Notifiable diseases—January–March 1934 579

Cholera, plague, smallpox, typhus fever, and yellow fever

Cholera 579

Plague 579

PUBLIC HEALTH REPORTS

VOL. 49 MAY 4, 1934 NO. 18

INTRAVENOUS USE OF COPPER SULPHATE COMBINED WITH SODIUM THIOSULPHATE IN TREATMENT OF TRACHOMA

By C E RICE, *Surgeon*, A A DRAKE, *Acting Assistant Surgeon*, and J E SMITH, *Acting Assistant Surgeon, United States Public Health Service*

In 1928 Emanuel Stastnik, of Czechoslovakia, reported very favorably (1) on the use of copper sulphate ($CuSO_4$ $5H_2O$) mixed with sodium thiosulphate, both locally and intravenously, in the treatment of trachoma The maximum dose of copper sulphate in this combination for intravenous use as reported by him was 100 mg. The weights of patients were not stated This meant 100 mg of copper sulphate combined with 1,000 mg of sodium thiosulphate. He termed the resulting combination copper thiosulphate.

Stastnik reported again in 1931 (2) concerning his further experience with copper thiosulphate in the treatment of trachoma He recorded some striking results, all very favorable. In this article he advocated maximum doses of 200 mg of copper sulphate ($CuSO_4$ $5H_2O$) combined with 2,000 mg of sodium thiosulphate. His intravenous injections were given at 4- and 5-day intervals. Weights of patients were not recorded. He considered 10 to 15 injections a course.

Because of these favorable reports it was decided to try out this form of therapy at the Trachoma Hospital at Rolla, Mo Complete translations of Stastnik's articles were furnished us by Dr. Georgiana Dvorak-Theobald, of Chicago. Dr Theobald informed us that she had tried out this form of therapy in 10 cases at the Illinois Eye and Ear Infirmary with favorable results (3).

The first group of patients receiving this therapy at the Trachoma Hospital at Rolla consisted of 9 cases of trachoma, 5 showing active lid and corneal lesions and 4 showing corneal lesions only with cicatricial lids The youngest was 7 years of age and the oldest 35 years. The dosage of copper sulphate ($CuSO_4$ $5H_2O$) used in combination with sodium thiosulphate is recorded as milligrams of copper sulphate to each kilogram of body weight. The copper therapy of this group was approached rather carefully and started with 10- to 20-mg doses of copper sulphate mixed with 1,000 mg of sodium thiosulphate. Injections were given at 4-day intervals, and the amount of copper sulphate used in combination with sodium thiosulphate was gradu-

ally built up until a maximum of 80 mg of copper sulphate with 1,000 mg of sodium thiosulphate ($Na_2S_2O_3$ $5H_2O$) was being given in some cases. A course consisted of 10 injections.

There were no unfavorable reactions in this series of 90 injections, the urinalysis remained negative, and the red blood cell count and hemoglobin were practically unchanged.

The copper sulphate and sodium thiosulphate were mixed just before the intravenous injection was given. The solution resulting from mixing these two chemicals is colorless, and there is a very low concentration of free copper ions After the mixture stands for a few minutes, a white precipitate of sulphur settles out and the concentration of free copper ions is then much higher The injection must be given before this white precipitate starts to form

The tabulations of the cases presented herewith show the age, body weight, the maximum amount of copper sulphate, the amount of copper sulphate per kilogram of body weight, the change in lid and corneal pathology, and the symptomatic changes.

Series I

Case	Age	Body weight	Maximum amount of copper sulphate	Milligrams of copper sulphate to each kilogram of body weight	Change in lid and corneal pathology	Symptomatic change
		Kg	*Mg*			
A W	25	86 3	40	0 46	No change	None
L S	20	82 7	40	49	Slightly worse	Improved
E K	26	73 6	40	54	Slight corneal improvement	Do
M A	14	48 1	30	62	No change in pathology	None
L D	27	49 7	40	82	No change	Do
S H	48	46 3	40	86	do	Improved
D L	7	20 4	20	9	Corneae and lids became worse	None.
J M	21	69 5	80	1 15	No change in pathology	Improved
B E	35	63 1	80	1 26	Slight improvement in lid pathology Cornea same	Do

From this series of cases we could not feel very much encouraged regarding the use of this form of therapy in trachoma as grattage had to be done on five of the cases following the course of treatment. The other four cases were of the corneal type, with the cicatricial lids. There was improvement of slight degree in corneal and lid pathology in only two cases. It should be stated that these trachoma eyes received no local treatment while under this form of therapy, as a properly controlled check on the effect of this intravenous medication was desired. The symptomatic improvement indicated in some of the cases in this series could have come from the improved hygienic surroundings of the patients.

Five other cases were treated with larger dosage of the copper sulphate in combination with sodium thiosulphate. Four of these showed marked lid activity, both of a papillary and granular nature,

together with corneal lesions. One showed only corneal activity with cicatricial lids

These cases are tabulated as follows:

Series II

Case	Age	Body weight	Maximum dosage of copper sulphate	Milligrams of copper sulphate to each kilogram of body weight	Change in lid and corneal pathology	Symptomatic change
		Kg	*Mg*			
W C	47	73 6	180	2 4	Corneae improved Lids cicatricial	Improved
W S	28	73 6	205	2 7	Lids and corneae improved	Do
B P	21	66 8	205	3 06	No change	Do
R J [1]	33	63 6	205	3 2	Slight corneal and lid improvement	Do
C C	17	49 5	205	4 1	Lids improved	Do

[1] Returned 3 months later with another flare-up of trachoma

Three of the cases in series II required grattage after finishing the course of 10 injections of copper thiosulphate The most improvement was symptomatic However, these cases showed more improvement in pathology than did those in series I.

In this latter group the amount of copper sulphate used in the combination started at 60 mg and was built up to 205 mg in 5 to 6 doses at 4-day intervals. The amount of sodium thiosulphate varied from 1,000 mg to 2,000 mg.

The rather remarkable finding in this group was the marked reduction in red blood cells and hemoglobin, probably due to excessive dosage of copper thiosulphate. The reduction in the red blood cell count varied from 15 percent to 30 percent. The loss of red blood cells was rapidly made good on stopping the copper therapy and placing the patient on an extranutritious diet

In preparing the copper sulphate stock solution, the crystals of $CuSO_4 5H_2O$ selected should be of a clear blue color, and should be sterilized in crystal form. Definite weights of the crystals were wrapped in paper and gauze and sterilized in a pressure sterilizer along with surgical dressings. The crystals become white in this process, owing to loss of water of crystallization. Their blue color becomes reestablished, however, on the addition of water. If sterilization is done after the crystals are dissolved in water, a marked precipitate of a light greenish color occurs, which is basic copper sulphate. The sodium thiosulphate crystals ($Na_2S_2O_3 5H_2O$) can be dissolved in water and the solution then sterilized. This solution can be kept over a period of several weeks and used as needed. It was our practice to use a 10 percent stock solution of copper sulphate. Thus each cubic centimeter of this solution contained 100 mg of copper sulphate. A tuberculin syringe was used to measure out the proper

amount The stock solution of sodium thiosulphate was of 20 percent strength, and so each cubic centimeter contained 200 mg of $Na_2S_2O_3 5H_2O$. When using 100 mg or less of copper sulphate, 1,000 mg of sodium thiosulphate was mixed with it The injection should be given immediately after mixing, since, as previously stated, a white precipitate starts to form within 3 or 4 minutes after mixing This precipitate is free sulphur and indicates that the copper is becoming disassociated in the copper thiosulphate union. In using 200 mg of copper sulphate, 2,000 mg of sodium thiosulphate was mixed with it. On mixing the copper sulphate solution with the sodium thiosulphate solution, the blue color of copper sulphate should disappear immediately

To characterize this therapy as the use of copper thiosulphate only is a mistake, since four different chemicals are being introduced into the blood stream. These are sodium tetrathionate ($Na_2S_4O_6$), sodium sulphate (Na_2SO_4), cuprous thiosulphate ($Cu_2S_2O_3$), and sodium thiosulphate ($Na_2S_2O_3$) When mixing 60 mg of copper sulphate with 1,000 mg of sodium thiosulphate, there results approximately 32 4 mg of sodium tetrathionate, 34 mg of sodium sulphate, 28 mg of cuprous thiosulphate, and an undetermined excess of sodium thiosulphate. It is probable, as Stastnik considers, that the active chemical is the cuprous thiosulphate.

CONCLUSIONS

1. A combination of copper sulphate with sodium thiosulphate was used intravenously in varying doses as a therapeutic measure in trachoma.
2. In the smaller doses no change was seen in the trachoma pathology. There was symptomatic improvement, however, in some cases.
3. In the larger doses there seemed to be some slight effect on the trachoma pathology as well as in symptoms
4. In the larger doses advocated by Stastnik, there was an undesirable reduction in red blood cells and hemoglobin.
5. It would seem desirable for anyone experimenting further with this method of therapy to use caution in going above 1.25 mg of copper sulphate per kilogram of body weight in combination with sodium thiosulphate, and to keep a close check on the hemoglobin.
6. In none of our cases did we secure the striking beneficial results described by Stastnik in his cases.
7. This form of therapy did not cause any immediate untoward reactions after any of the intravenous injections, neither was there any undesirable effect on the kidneys that could be ascertained by frequent urinalysis.

8 It seems to us that the possible dangers of this form of therapy outweigh any slight benefits obtained from it Certainly it does not compare with the older established methods of therapy.

ACKNOWLEDGMENTS

We wish to acknowledge our appreciation for much help rendered, to Dr. W. T. Schrenk, of the chemistry department of the Missouri School of Mines, and Dr L F. Yntema, of the chemistry department of St Louis University Medical School.

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MORTALITY IN CERTAIN STATES DURING 1933, WITH COMPARATIVE DATA FOR RECENT YEARS [1]

For several years the United States Public Health Service has secured current mortality data from the State health departments of as many States as could furnish the information, and has published death rates for important causes. The rates are computed from preliminary reports, and, because of (*a*) some lack of uniformity in the method of classifying deaths according to cause, (*b*) some delayed death certifiates, and (*c*) various other reasons, these preliminary rates cannot be expected to agree in all instances with final rates published by the Bureau of the Census The final figures are based on a complete review and retabulation of the individual death certificates from each State. The preliminary rates given in the accompanying tables are intended to serve as a current index of mortality until final figures are available.

For purposes of comparison, the mortality rates for a few preceding years are given. These comparative rates are from the same source as are the current reports. Although final figures are often available for earlier years, the provisional figures are retained as being more comparable with current preliminary rates.

In table 1 the death rates for important causes for groups of States have been brought together The majority of the rates are based on data from 28 States, with a population of nearly 95 million. The detailed tables show rates for each State. The summary table includes for each cause every State that is included for all five years in the detailed tables. While the rates in this group of States may not be the same as those for the total registration area, it is highly

[1] From the Office of Statistical Investigations, U.S. Public Health Service.

probable that the trend of the rates in these States will be comparable with the trend in the total area.

In considering the trend of the rates in the 5-year period shown in the tables it should be remembered that the mortality in 1929 was increased somewhat by the influenza epidemic of the winter of 1928-29. However, 1930 was free from any widespread epidemic, and such epidemics as occurred in 1931, 1932, and 1933 were of a minor character.

The death rate for all causes in the 27 States which could be grouped for this item was 10 5 in 1933, as compared with 10 8 and 11.0 in 1932 and 1931, respectively Of these 27 States, 14 showed a decline in 1933 from 1932, 6 showed an increase, and 7 remained the same in both years.

In 25 States the infant mortality in 1933 was 56 per 1,000 live births, as compared with 57 and 60 for 1932 and 1931, respectively. Considering the individual States, 12 of the 25 States with data available for both years showed a decrease in 1933 as compared with 1932, with increases in 10 States and 3 States remaining the same.

In spite of the fact that 1933 represents the fourth year of the depression, the death rate from tuberculosis in the group of 28 States was only 57 per 1,000, as compared with 60 and 65 in 1932 and 1931, respectively. Of these 28 States, 24 showed a decline and only 4 an increase.

Typhoid fever continued a rather steady decline, being 2.6 per 100,000 for 1933 as compared with 3 2 and 3.8 for 1932 and 1931, respectively. Eighteen of the 28 States showed a decrease in 1933 as compared with 1932, 2 remained the same, and 8 had a higher rate in 1933 than in 1932. Diarrhea and enteritis was nearly the same this year as last. The deaths of children under 2 years of age amounted to 10.0 per 100,000 total population, as compared with 10.3 and 14.0 in 1932 and 1931, respectively. Of the 27 States with available data, 12 decreased, 13 increased and 2 States remained the same in 1933 as in 1932.

Influenza of apparently mild form was rather prevalent in December of 1932 and January of 1933. Minor epidemics also occurred in 1932 and 1931, but 1930 was free from any excess deaths from this cause. The deaths credited to influenza in 1933 amounted to 24 per 100,000, as compared with 28 and 26 in 1932 and 1931, respectively. All of these figures are above the 1930 rate but are distinctly less than that for 1929, when a more severe epidemic occurred. Mortality from pneumonia was less in 1933 than in preceding years, being 69 in 1933 as compared with 77 and 82 in 1932 and 1931, respectively. Considering both influenza and pneumonia, the mortality rate of 93 per 100,000 in 1933 is slightly less than in 1932 or 1931—105 and 107, respectively.

Of the 28 States, 22 had lower influenza rates and 23 had lower pneumonia rates in 1933 than in 1932.

Because of wave-like fluctuations that occur in the incidence of the communicable diseases of children, the comparison of one year with another means little as to the real trend of the mortality from these diseases Diphtheria, which has been declining for many years, reached a new low level of 2 9 in these 28 States, as compared with 3 8 and 4.1 in 1932 and 1931, respectively. In both 1933 and 1932 the mortality from this much-dreaded disease was less than that from whooping cough.

The death rate from poliomyelitis was about the same in 1933 as in 1932, but less than in 1931 and 1930 In 1930 the disease was epidemic in certain States, and 1931 marked a considerable epidemic in the Eastern States, particularly in New York City. Fifteen of the 28 States had lower rates in 1933 than in 1932, 12 had higher rates, and in 1 State the 2 years were the same. Meningitis mortality was likewise low in 1933; 20 of the 28 States showed decreases in 1933, as compared with 1932.

The death rate from diabetes was about the same in 1933 as in 1932. In 13 of the 28 States there was a decrease in 1933, as compared with 1932, in 12 States an increase, with the other 3 States remaining the same in the 2 years.

Cancer continued its steady increase, the rate of 103 per 100,000 in 1933 being greater than in any other year included. Twenty-three of the 28 States increased in 1933, as compared with 1932.

Diseases of the heart continued to increase, 19 of the 26 States with available data having higher rates in 1933 than in 1932. The death rate for nephritis was slightly less in 1933 than in 1932 Of the 27 States with data available for both 1933 and 1932, 19 had a lower rate and 8 a higher rate in 1933 than in 1932. In 25 States with available data on cerebral hemorrhage, the rate in 1933 was about the same as in 1932 In 13 of these States there was a decrease and in 12 an increase in 1933 over 1932.

The year 1933 as a whole exhibits an exceptionally favorable mortality record. Table 2 shows death rates from specific causes in each quarter of the year for the 24 States with data available in 3-month periods The first quarters of 1933, 1932, and 1931 all contain minor influenza epidemics. However, the death rate from all causes in this quarter was less in 1933 than in either of the preceding years. The rates for the second and third quarters were also lower in 1933 than in either 1932 or 1931. In the last quarter of 1933 the rate was less than in 1932 but more than in 1931. The last quarters of 1933 and 1931 were free from excess influenza mortality, but December of 1932 contained a part of the epidemic of 1932–33. The mortality situation

in the last quarter of 1933 was therefore not quite as favorable as in the first three quarters.

TABLE 1.—*Summary of mortality from certain causes in a group of States, 1929–33* [1]

Diseases (numbers in parentheses are from the International List of Causes of Death, fourth revision, 1929)	1933	1932	1931	1930	1929
	Death rate per 1,000 population				
27 States (population July 1, 1933 93,015,000)					
All causes	10 5	10 8	11 0	11 2	11.8
	Deaths under 1 year per 1,000 live births				
25 States (live births 1,398,252)					
Total infant mortality	56	57	60	62	66
19 States (live births 1,127,447)					
All infant mortality except malformation and early infancy	24	25	28	27	31
	Deaths of mothers per 1,000 live births				
26 States (live births 1,434,711)					
Maternal mortality	5 6	5 9	6 2	6 2	6 4
	Death rate per 100,000 population				
28 States (population July 1, 1933 94,762,000)					
Typhoid fever (1, 2)	2 6	3 2	3 8	4 0	3 6
Measles (7)	1 6	1 5	2.5	2 9	2.4
Whooping cough (9)	3 2	4 2	3 6	4 3	5 8
Scarlet fever (8)	2 0	2 0	2 1	1 9	2.1
Diphtheria (10)	2 9	3 8	4 1	4 6	6 4
Acute anterior poliomyelitis (16)	6	7	1 9	1 1	7
Meningococcus meningitis (18)	1.0	1.3	2 1	3 1	3 9
Influenza (11)	23 9	28 0	25 7	19 1	52 8
Pneumonia, all forms (107–109)	69 4	77.4	82 0	83 2	92.5
Tuberculosis, all forms (23–32)	56 5	60 4	64 8	68 2	72 8
Cancer (45–53)	102 6	100 7	97.6	96 5	95 5
Diabetes (59)	21 5	21 7	20 3	19 1	18.8
27 States (population July 1, 1933 93,015,000)					
Diarrhea and enteritis under 2 years (119)	10 0	10 3	14 0	17 9	16 5
Nephritis, all forms (130–132)	80 8	84 4	83 7	88 0	90 7
26 States (population July 1, 1933. 89,744,000):					
Diseases of the heart (90–96)	224 8	219 5	211 7	209 6	215 1
25 States (population July 1, 1933· 88,100,000).					
Cerebral hemorrhage, apoplexy (82, a, b)	79 2	79.3	78 5	78 9	79 6

[1] See tables 3 and 4 for names of States included for each disease. The District of Columbia is counted as a State.

TABLE 2.—*Mortality from certain causes in each quarter of 1933, 1932, and 1931, in the 24 States*[1] *with available data*

[Population July 1, 1933 79,880,000]

Period	All causes, rate per 1,000 population	Rate per 1,000 live births: Total infant mortality	Rate per 1,000 live births: All except malformations and early infancy	Rate per 1,000 live births: Maternal mortality	Typhoid fever (1)	Measles (7)	Scarlet fever (8)	Whooping cough (9)	Diphtheria (10)	Influenza (11)	Poliomyelitis (16)	Lethargic encephalitis (17)	Meningococcus meningitis (18)	Tuberculosis, all forms (23–32)	Cancer, all forms (45–53)	Diabetes (59)	Diseases of the nervous system (78–89)	Cerebral hemorrhage, apoplexy (82a–b)	Diseases of the circulatory system (90–103)	Diseases of the heart (90–95)	Diseases of the respiratory system (104–114)	Pneumonia, all forms (107–109)	Diseases of the digestive system (115–129)	Diarrhea and enteritis under 2 years (119)	Nephritis (140–150)
					Death rate per 100,000 population (annual basis)																				
January–December																									
1933	10.6	56	25	5.6	2.4	1.7	1.9	3.0	2.8	24.0	0.7	0.8	0.8	56.4	105.8	22.1	102.9	80.2	257.3	225.2	81.8	70.3	68.0	9.8	79.0
1932	10.9	56	27	5.9	2.9	1.6	2.0	4.1	3.7	29.0	.7	.7	1.2	60.4	103.8	22.3	105.4	81.9	254.9	221.4	90.8	78.4	68.5	10.3	81.2
1931	11.0	60	29	6.1	3.5	2.4	1.9	3.5	3.7	24.6	2.0	.9	2.2	64.8	100.5	20.8	106.1	80.6	246.9	212.9	95.5	83.1	74.1	13.9	80.7
January–March																									
1933	11.7	65	32	6.1	1.2	2.0	2.7	3.0	2.5	64.2	.3	.8	1.2	60.1	104.3	25.4	113.1	88.3	284.9	240.6	121.3	108.3	59.4	5.2	85.5
1932	11.8	60	29	6.3	1.9	2.1	3.0	5.0	4.5	44.2	.4	.8	1.9	65.4	102.1	24.9	114.5	89.1	282.0	245.0	130.7	110.7	61.6	5.5	89.1
1931	12.5	74	40	6.9	1.3	3.3	2.8	3.3	3.6	60.2	.5	1.0	3.2	69.3	100.5	23.4	117.6	89.0	283.9	245.1	165.9	150.3	65.5	7.2	88.7
April–June																									
1933	10.4	54	23	6.0	1.7	3.3	2.2	2.0	1.4	12.7	.4	.7	.9	59.9	105.7	21.5	103.8	79.7	254.6	221.8	71.7	60.1	67.3	8.8	80.4
1932	10.8	58	27	6.3	1.7	3.3	2.5	4.9	2.4	24.4	.4	.7	1.4	65.5	103.6	22.0	107.4	82.3	255.7	221.8	84.2	73.2	67.2	9.0	82.6
1931	11.1	58	26	6.6	1.8	4.9	2.6	3.4	2.2	22.8	.5	1.1	2.5	69.6	101.5	20.6	109.6	82.8	248.4	214.5	90.5	77.9	70.4	9.2	82.9
July–September																									
1933	9.4	49	20	5.3	4.1	.5	.8	3.4	1.9	4.8	1.4	.9	.6	53.0	105.6	18.8	89.8	70.0	218.4	190.5	41.9	33.2	77.7	15.5	70.1
1932	9.5	50	22	5.8	5.0	.5	.7	3.9	2.5	5.6	1.3	.7	.8	55.4	102.8	18.2	90.8	70.5	213.2	183.6	42.5	33.8	80.3	18.0	71.4
1931	10.0	54	24	5.8	6.2	.7	.8	4.0	2.3	5.1	5.2	.8	1.4	62.5	99.6	18.0	93.8	70.8	209.8	182.3	44.8	36.2	87.8	24.1	72.2
October–December																									
1933	10.8	56	25	5.1	2.8	.8	2.1	2.7	5.5	14.9	.6	.8	.7	52.6	107.4	22.7	105.0	83.1	272.0	239.3	93.0	80.2	67.5	9.5	80.2
1932	11.4	59	30	5.4	3.0	.6	1.9	2.7	5.4	41.9	.7	.7	.9	55.3	106.8	24.2	108.9	85.3	268.8	235.4	106.0	90.2	64.7	8.8	81.9
1931	10.6	56	25	5.3	4.8	.6	1.4	3.4	6.9	11.4	1.9	.7	1.5	59.3	102.6	21.6	103.5	80.2	246.4	214.8	82.3	70.6	72.6	15.5	80.7

[1] Includes all States for which data are available by quarters for the 3 years covered The States are Alabama, California, Connecticut, District of Columbia, Georgia, Idaho, Indiana, Iowa, Kansas, Louisiana, Maryland, Michigan, Minnesota, Montana, Nebraska, New Jersey, New York, Ohio, Pennsylvania, South Dakota, Tennessee, Virginia, West Virginia, and Wisconsin

TABLE 3.—*Mortality in certain States, 1929–33*

State	Deaths, all causes, per 1,000 population					Maternal mortality per 1,000 live births				
	1933	1932	1931	1930	1929	1933	1932	1931	1930	1929
Total	10.5	10.8	11.0	11.2	11.8	5.6	5.9	6.2	6.2	6.4
Alabama	9.8	10.0	10.4	11.2	12.2	6.9	7.1	7.4	8.1	8.3
California	11.2	10.9	11.3	11.6	11.9	4.8	5.8	6.3	5.3	5.2
Connecticut	10.1	10.1	10.4	10.5	11.0	6.0	5.7	6.8	8.5	5.9
District of Columbia	15.9	16.1	15.9	15.2	15.4	4.8	7.9	6.1	9.1	6.1
Georgia	10.4	10.9	11.1	11.8	11.8	7.7	9.5	10.0	10.6	10.4
Idaho	9.6	9.2	9.6	9.7	9.2	2.8	4.4	2.6	4.4	6.1
Illinois	10.5	10.5	11.1	10.9	11.6	5.0	5.1	5.4	5.4	6.8
Indiana	11.0	11.2	11.3	11.6	12.2	5.7	5.2	5.9	5.8	7.0
Iowa	10.2	10.2	10.3	10.6	10.4	4.9	4.4	4.1	7.0	5.4
Kansas	10.4	10.1	10.0	10.4	10.4	4.8	5.4	5.8	7.0	6.1
Louisiana	10.6	10.6	10.9	11.8	11.8	8.1	8.2	8.9	9.8	10.3
Maryland	12.2	12.5	13.2	13.2	13.5	4.9	4.6	6.0	5.3	5.6
Michigan	9.6	9.7	9.8	10.6	11.8	5.5	5.7	5.9	5.9	6.1
Minnesota	9.6	9.6	9.6	9.7	9.9	4.5	4.1	4.6	4.8	3.9
Mississippi	9.8	9.2	9.9	10.8	11.6	...	...	...	...	...
Montana	9.7	9.7	9.7	9.8	10.7	5.8	5.7	7.0	6.8	8.4
Nebraska	9.2	9.2	9.1	9.4	9.6	4.2	5.0	5.1	5.3	5.4
New Jersey	10.4	10.1	10.6	10.7	11.5	5.1	5.7	5.9	5.7	5.3
New York	11.2	11.3	11.6	11.7	12.4	6.8	6.1	5.9	5.6	5.4
North Carolina	9.3	9.4	10.2	11.4	11.9	6.4	6.8	7.8	7.6	7.5
Ohio	10.7	11.1	11.1	11.4	12.5	5.9	5.9	6.0	5.5	6.6
Pennsylvania	10.7	10.9	11.3	11.3	12.1	5.1	5.4	5.7	5.3	5.9
South Dakota	8.8	8.2	8.6	8.5	8.6	4.1	3.7	4.9	5.6	5.5
Tennessee	10.4	10.5	10.7	11.4	11.7	5.9	6.6	6.8	7.9	7.8
Virginia	10.8	10.9	11.6	11.7	12.0	5.6	6.6	7.4	6.6	6.5
West Virginia	9.4	10.0	10.0	10.4	10.6	5.1	5.1	5.2	5.7	5.3
Wisconsin	9.8	10.0	10.1	10.3	10.7	4.7	4.3	4.3	4.8	5.3
Hawaii	9.6	9.7	9.8	10.4	12.2	5.8	...	...	...	...
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	8.4	8.4	8.5	8.4	8.9	...	...	...	...	...

State	Infant mortality rate per 1,000 live births									
	Total infant mortality					All except malformations and early infancy				
	1933	1932	1931	1930	1929	1933	1932	1931	1930	1929
Total	56	57	60	62	66	24	25	28	27	31
Alabama	66	61	65	73	74	40	36	40	45	44
California	53	53	57	59	63	24	23	26	29	32
Connecticut	48	48	54	56	65	...	...	...	...	...
District of Columbia	65	73	71	70	69	27	33	35	36	34
Georgia	68	65	69	78	76	...	...	...	...	...
Idaho	47	58	59	51	55	14	32	27	24	25
Illinois	51	52	56	56	61	20	21	25	23	26
Indiana	55	56	59	58	66	24	26	28	26	31
Iowa	50	48	51	56	52	19	20	22	22	21
Kansas	53	48	48	52	57	23	18	19	22	26
Louisiana	71	66	68	80	76	39	36	40	49	48
Maryland	65	70	79	73	80	31	35	45	38	42
Michigan	51	54	56	63	67	18	22	22	27	31
Minnesota	50	43	47	47	48	20	15	17	17	18
Montana	49	49	56	59	64	...	...	...	...	...
Nebraska	51	43	47	49	52	19	15	19	19	23
New Jersey	46	52	57	57	61	...	...	...	...	...
New York	54	53	57	58	61	22	22	33	26	27
North Carolina	66	67	73	77	79	...	...	...	...	...
Ohio	52	60	59	58	66	19	26	26	25	23
Pennsylvania	53	59	65	66	71	24	31	34	30	38
South Dakota	55	51	58	56	56	25	23	28	26	27
Tennessee	71	69	70	71	79	44	42	44	44	53
Virginia	63	66	72	71	74	...	...	...	...	...
Wisconsin	49	51	53	56	61	17	19	20	23	27
Hawaii	72	76	75	82	101	44	...	...	...	...

TABLE 4.—*Death rates for various causes per 100,000 population*

State	Typhoid fever (1,2)					Diarrhea and enteritis under 2 years (119)				
	1933	1932	1931	1930	1929	1933	1932	1931	1930	1929
Total	2.6	3.2	3.8	4.0	3.6	10.0	10.3	14.0	17.9	16.5
Alabama	4.3	4.9	6.9	7.9	7.5	18.7	15.4	20.6	31.2	25.3
California	1.5	1.3	1.6	1.7	1.7	8.4	8.2	11.5	14.8	15.3
Connecticut	.5	.5	1.0	.9	.8	4.7	4.2	7.8	10.5	13.8
District of Columbia	3.6	1.4	3.9	3.3	2.7	11.5	16.0	16.7	19.9	18.4
Georgia	8.4	12.6	16.7	16.4	11.6	16.7	13.2	18.8	24.8	17.9
Idaho	4.5	3.3	3.6	4.7	3.2	2.0	2.0	4.7	4.7	8.3
Illinois	1.4	1.7	1.5	1.9	1.4	6.4	6.9	3.9	5.9	12.2
Indiana	2.7	2.5	2.8	3.7	3.5	10.9	11.4	13.1	18.4	16.9
Iowa	1.0	1.7	1.4	1.6	2.3	2.7	3.1	5.0	6.6	3.9
Kansas	1.5	1.7	2.2	3.0	2.9	8.5	7.2	8.1	12.1	10.4
Louisiana	11.4	10.8	14.5	11.7	10.6	19.1	14.0	22.4	22.1	26.3
Maryland	2.2	3.1	5.4	6.4	4.3	16.7	19.6	31.3	30.0	32.5
Michigan	1.0	1.1	1.4	1.8	1.7	5.8	6.3	9.2	14.4	16.0
Minnesota	.8	.7	.6	1.0	.9	5.0	3.9	4.4	6.8	4.1
Mississippi	6.0	6.3	9.5	10.2	8.8	15.1	10.9	14.4	15.0	19.2
Montana	2.8	2.8	2.2	3.2	5.8	5.0	5.0	10.0	15.3	10.6
Nebraska	.7	1.4	1.7	1.6	1.8	4.7	4.9	7.1	8.3	6.6
New Jersey	1.0	.7	1.0	1.1	1.4	4.3	5.6	9.1	11.5	12.2
New York	.8	1.0	1.1	1.2	1.3	6.8	6.4	8.7	11.4	11.9
North Carolina	3.9	5.0	5.1	4.4	5.5	21.0	16.8	22.2	29.7	30.1
Ohio	1.7	2.0	2.4	3.3	2.2	8.1	9.2	11.7	16.4	12.5
Pennsylvania	1.3	1.8	2.1	2.6	2.1	8.7	12.3	17.5	22.5	19.7
South Carolina	10.5	14.7	16.6	16.9	14.4	----	----	----	----	----
South Dakota	5.0	1.4	2.7	2.9	3.2	8.1	6.4	11.4	11.0	5.5
Tennessee	8.9	11.0	10.7	12.2	11.9	24.0	20.4	23.4	28.6	23.9
Virginia	4.4	5.1	7.3	5.8	4.4	16.1	14.8	22.5	26.1	19.7
West Virginia	8.0	12.1	12.6	12.1	11.5	32.9	48.9	54.3	70.1	57.8
Wisconsin	.5	.7	.7	.9	1.4	6.6	6.8	10.4	10.2	11.7
Hawaii	5.3	2.4	2.6	2.4	3.9	36.5	45.7	49.3	76.6	103.1
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over [1]	1.6	1.7	2.4	2.4	2.4	4.6	4.6	5.9	8.0	7.9

State	Measles (7)					Whooping cough (9)				
	1933	1932	1931	1930	1929	1933	1932	1931	1930	1929
Total	1.6	1.5	2.5	2.9	2.4	3.2	4.2	3.6	4.3	5.8
Alabama	1.0	.2	6.4	3.1	2.4	6.4	7.4	3.6	9.5	9.2
California	1.8	.9	1.9	5.2	.3	3.2	2.9	2.4	3.5	5.0
Connecticut	.5	1.1	2.3	.4	3.0	1.6	2.7	2.7	2.0	2.6
District of Columbia	.8	.2	2.4	.2	(2)	1.4	4.0	5.7	2.7	5.0
Georgia	2.1	.5	2.1	4.4	1.0	7.3	3.8	3.8	9.0	9.4
Idaho	.7	.2	1.8	2.0	2.7	.2	.7	6.3	4.3	3.6
Illinois	.7	.6	4.2	1.0	3.6	1.0	2.9	2.7	2.1	3.4
Indiana	.4	.4	4.5	1.9	3.7	2.1	5.0	4.3	3.0	5.4
Iowa	.2	.2	.1	8.1	1.4	2.6	2.0	2.4	3.7	4.1
Kansas	.7	1.3	.4	4.2	2.4	3.2	2.5	1.3	3.5	3.9
Louisiana	1.7	1.7	.6	4.7	2.5	5.6	4.0	5.4	5.9	5.4
Maryland	.2	1.1	5.9	.4	1.4	4.9	5.4	7.6	4.4	7.9
Michigan	2.2	3.6	.6	4.7	3.1	3.0	3.9	3.7	3.6	5.4
Minnesota	3.7	.5	.3	3.3	3.2	2.9	1.7	2.1	2.6	4.5
Mississippi	2.7	.1	.4	1.4	4.3	10.1	4.9	3.4	6.9	9.4
Montana	2.6	2.2	.4	2.2	9.3	3.0	4.1	8.9	3.0	3.3
Nebraska	.6	.1	.3	6.2	2.4	2.0	1.9	4.0	2.6	3.6
New Jersey	1.7	1.0	2.4	3.2	.9	1.0	2.9	3.3	2.2	4.7
New York	2.5	1.6	1.8	1.9	1.5	2.2	2.3	2.9	2.8	3.0
North Carolina	2.6	1.8	3.2	.1	.6	6.0	6.9	5.7	8.5	8.3
Ohio	1.7	2.4	2.1	2.8	3.5	2.3	4.9	2.4	3.0	8.0
Pennsylvania	1.2	2.1	4.2	2.3	3.8	1.9	4.4	3.1	3.9	6.0
South Carolina	3.5	2.4	2.2	.5	.1	6.2	7.6	5.3	10.8	12.7
South Dakota	1.0	(2)	.3	3.0	2.2	6.3	6.3	5.7	2.7	3.8
Tennessee	2.9	.3	3.8	4.9	1.0	5.7	7.5	6.3	6.3	7.4
Virginia	2.1	.9	3.2	3.9	1.6	4.4	12.5	6.2	10.8	10.9
West Virginia	2.5	9.8	2.3	4.9	4.5	6.0	10.2	7.4	12.0	12.8
Wisconsin	.9	1.4	1.4	3.3	2.7	2.0	2.2	1.9	3.3	3.8
Hawaii	.5	6.6	10.2	4.3	5.0	12.4	1.1	.3	3.5	27.9
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	1.3	1.4	2.6	2.3	2.4	1.0	1.4	1.7	1.9	3.0

[1] The Metropolitan Life Insurance Co. data for diarrhea and enteritis includes adults as well as children under 2 years.
[2] No deaths.

TABLE 4.—*Death rates for various causes per 100,000 population*—Continued

State	Scarlet fever (8)					Diphtheria (10)				
	1933	1932	1931	1930	1929	1933	1932	1931	1930	1929
Total	2.0	2.0	2.1	1.9	2.1	2.9	3.8	4.1	4.6	6.4
Alabama	7	1.3	1.1	1.4	1.4	5.8	7.5	7.6	7.1	9.6
California	1.4	9	9	1.2	1.7	1.9	3.3	2.9	3.4	3.4
Connecticut	1.4	1.1	7	1.5	9	1.0	1.0	9	2.0	3.8
District of Columbia	2.6	2.6	1.0	2.3	2.3	2.8	3.2	7.1	3.7	7.0
Georgia	6	6	1.5	1.3	1.3	6.2	5.7	5.0	4.5	6.0
Idaho	2	1.9	2.2	2.0	9	1.8	3.1	2.5	3.1	2.3
Illinois	3.5	3.3	4.5	3.9	3.9	1.7	3.0	4.7	7.1	9.9
Indiana	2.5	2.6	3.4	2.1	3.2	4.4	5.0	4.1	4.1	4.7
Iowa	1.8	1.5	1.6	2.5	2.2	2.1	2.3	1.7	1.8	1.3
Kansas	2.1	1.7	1.2	2.4	3.3	2.9	3.9	3.7	3.6	3.6
Louisiana	5	4	7	6	6	4.7	6.5	6.4	5.0	6.6
Maryland	2.3	1.9	1.9	2.1	2.3	1.7	3.1	4.0	3.4	4.5
Michigan	3.1	2.2	2.3	2.7	3.0	2.2	2.1	3.5	6.2	10.5
Minnesota	1.4	1.6	9	1.4	2.6	1.0	9	1.4	1.2	2.6
Mississippi	4	6	5	6	3	5.4	6.2	9.9	6.8	7.1
Montana	1.9	1.5	1.9	2.8	3.0	3.0	9	1.7	7	1.9
Nebraska	1.7	2.0	1.5	2.2	3.8	1.5	4.0	3.5	3.3	3.5
New Jersey	1.4	1.7	2.0	1.5	1.1	1.2	2.3	2.9	8.2	11.2
New York	1.7	2.8	1.7	1.1	1.4	1.1	2.1	2.2	2.7	5.3
North Carolina	1.4	1.1	2.0	1.2	1.7	6.1	4.5	7.3	7.9	11.0
Ohio	3.2	3.3	3.3	2.6	2.2	2.5	3.3	2.8	2.8	3.4
Pennsylvania	2.8	2.6	2.3	1.9	2.5	2.3	4.0	3.6	5.2	7.2
South Carolina	8	5	1.0	7	9	5.2	4.9	4.9	7.3	8.6
South Dakota	1.6	1.3	6	6	2.6	2.3	2.9	2.6	2.9	1.6
Tennessee	1.8	8	2.4	1.6	2.4	8.2	8.2	9.3	6.6	8.4
Virginia	2.1	1.3	1.4	1.1	1.5	6.3	5.3	8.5	6.1	7.8
West Virginia	2.5	2.4	1.7	1.9	1.5	10.7	13.2	9.3	6.2	7.4
Wisconsin	1.2	1.5	2.1	3.0	2.5	.6	1.9	1.8	2.4	2.8
Hawaii	(2)	3	(2)	3	(2)	1.8	4.8	5.7	11.3	8.9
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	2.6	2.8	3.2	2.5	2.7	2.5	3.8	4.3	5.7	8.6

State	Poliomyelitis (16)					Meningococcus meningitis (18)				
	1933	1932	1931	1930	1929	1933	1932	1931	1930	1929
Total	0.6	0.7	1.9	1.1	0.7	1.0	1.3	2.1	3.1	3.9
Alabama	4	2	9	8	1.0	4	6	3.6	1.5	1.0
California	2	5	8	2.8	.9	1.3	1.4	2.5	2.8	6.9
Connecticut	2	4	5.5	1.1	4	5	7	7	9	1.3
District of Columbia	4	1.2	8	6	8	2.2	2.6	5.7	2.0	2.9
Georgia	7	.9	1.2	1.1	7	4	8	1.8	3.0	2.3
Idaho	9	2	.7	1.3	1.4	1.6	3.1	6.9	6.9	22.3
Illinois	4	5	1.3	7	.3	2.7	2.0	3.2	2.4	3.3
Indiana	3	.2	6	7	.3	1.4	3.9	5.5	8.3	2.7
Iowa	1.6	1.0	1.1	1.7	.9	1.4	9	2.6	3.3	1.6
Kansas	7	.6	.6	3.6	5	1.1	1.3	1.3	2.8	2.8
Louisiana	4	5	9	2.3	6	1.2	1.2	2.3	3.6	2.7
Maryland	.2	.3	.7	4	.2	1.1	1.1	1.8	1.3	1.8
Michigan	1	.5	2.2	8	1.0	6	1.3	2.4	7.5	17.9
Minnesota	1.3	.5	2.4	1.6	.4	1.2	9	1.6	1.9	1.8
Mississippi	.3	8	.4	.5	.6	1.0	1.0	1.5	6.9	8
Montana	.4	1.1	2.8	1.1	(2)	6	1.3	2.2	4.1	10.0
Nebraska	3	9	.9	3.4	.7	6	5	1.6	2.5	2.6
New Jersey	6	1.1	3.5	.4	4	6	8	1.8	1.8	2.7
New York	1.1	5	5.2	1.0	9	7	1.2	2.7	2.6	4.8
North Carolina	4	5	6	4	6	.3	5	6	8	.5
Ohio	8	4	.8	1.6	6	.5	8	1.5	1.8	2.7
Pennsylvania	.6	1.5	1.0	.5	5	.9	1.3	1.9	2.2	2.8
South Carolina	.7	.6	9	.9	6	2.0	1.4	2.1	4.1	3.0
South Dakota	9	1.1	2.3	1.6	1.2	.1	4	3	3	1.3
Tennessee	1.2	6	9	1.0	1.2	9	1.4	4.3	9.6	2.2
Virginia	.4	7	.6	8	1.3	1.0	1.1	1.8	2.3	1.5
West Virginia	1.2	7	1.4	6	9	.9	1.1	1.0	1.1	8
Wisconsin	4	4	1.6	9	.4	5	9	1.3	2.0	3.7
Hawaii	5	.8	8	(2)	1.1	8	2.9	2.3	4.3	22.1
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	.6	1.0	2.6	1.1	6	------	------	------	------	------

[2] No deaths.

TABLE 4.—*Death rates for various causes per 100,000 population*—Continued

State	Influenza (11)					Pneumonia, all forms (107–109)				
	1933	1932	1931	1930	1929	1933	1932	1931	1930	1929
Total	23.9	23.0	25.7	19.1	52.8	69.4	77.4	82.0	83.2	92.5
Alabama	32.7	48.4	40.7	35.5	119.8	59.1	66.0	83.1	85.8	87.5
California	13.8	18.3	13.6	9.1	20.0	61.8	64.1	66.5	73.0	78.8
Connecticut	21.5	15.3	17.3	13.5	38.7	73.6	66.0	72.3	88.4	102.7
District of Columbia	9.9	15.5	18.1	8.2	20.5	115.6	135.5	140.3	122.1	143.3
Georgia	41.5	39.0	44.1	32.2	86.3	76.3	82.9	82.9	84.1	77.0
Idaho	18.7	21.0	9.2	11.2	36.7	72.8	76.7	76.5	104.0	61.9
Illinois	15.4	24.0	20.3	11.7	34.5	63.3	67.4	69.1	63.5	81.9
Indiana	30.0	42.1	33.3	19.7	59.2	66.5	84.1	82.3	83.5	98.8
Iowa	33.3	35.8	25.7	26.9	51.5	74.1	78.9	66.8	79.6	63.8
Kansas	45.9	41.6	30.0	29.3	51.3	53.4	53.5	51.5	54.2	58.0
Louisiana	32.4	52.4	42.1	39.9	79.1	64.1	75.5	81.4	91.5	85.9
Maryland	17.2	20.1	20.6	10.3	42.5	93.8	103.0	126.3	118.2	137.6
Michigan	17.0	22.2	16.5	11.9	37.3	54.4	63.3	57.6	68.2	88.8
Minnesota	24.5	30.8	21.8	15.9	39.6	58.9	68.8	69.1	71.1	70.5
Mississippi	34.8	40.5	37.5	29.3	105.6	49.6	48.3	56.3	60.9	62.7
Montana	35.8	41.6	32.7	22.9	42.4	63.3	63.6	70.3	80.2	81.9
Nebraska	34.5	36.9	21.8	17.7	45.9	70.0	62.0	54.3	64.0	60.1
New Jersey	12.3	14.0	13.6	8.9	25.2	71.3	61.3	78.0	77.7	103.5
New York	13.0	13.0	13.4	8.4	27.0	91.2	96.7	105.6	101.9	124.1
North Carolina	28.8	20.5	33.4	24.4	78.2	64.9	80.7	87.1	92.9	90.3
Ohio	22.9	34.1	28.8	19.4	59.6	66.6	76.8	77.9	74.6	91.2
Pennsylvania	25.4	29.3	28.1	19.8	56.1	70.7	81.5	97.2	92.4	106.4
South Carolina	37.5	50.8	65.9	49.7	80.4	87.4	99.0	104.8	102.4	97.0
South Dakota	45.1	28.9	26.0	24.4	51.5	61.0	46.6	55.4	58.1	62.6
Tennessee	39.7	54.1	37.0	31.3	106.1	77.4	87.1	84.5	88.9	91.5
Virginia	37.1	37.3	47.2	29.4	91.9	66.6	71.5	80.6	83.7	76.2
West Virginia	33.7	46.9	33.8	27.8	91.2	64.6	78.3	82.5	91.5	79.5
Wisconsin	25.6	28.5	18.1	30.7	42.3	51.4	66.5	65.4	72.6	74.6
Hawaii	7.4	11.3	11.0	10.5	17.6	97.8	100.1	102.3	118.2	141.1
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	18.7	17.7	19.2	13.2	37.7	54.8	56.7	62.1	62.7	74.0

State	Tuberculosis, all forms (23–32)					Cancer (45–53)				
	1933	1932	1931	1930	1929	1933	1932	1931	1930	1929
Total	56.5	60.4	64.8	68.2	72.8	102.6	100.7	97.6	96.5	95.5
Alabama	69.1	77.2	86.3	86.0	85.7	55.9	55.5	54.3	53.8	51.3
California	76.4	81.0	88.9	98.3	106.3	127.0	120.2	124.2	125.7	118.4
Connecticut	47.2	49.0	53.6	59.2	62.0	121.4	121.5	114.0	117.1	112.8
District of Columbia	124.6	121.5	120.2	116.8	116.6	149.5	146.7	135.2	136.7	131.8
Georgia	59.9	65.5	72.9	73.4	74.0	55.0	52.2	52.7	52.2	48.8
Idaho	31.0	28.6	29.8	32.9	42.5	82.6	76.6	66.4	61.4	78.8
Illinois	53.4	54.1	59.1	59.6	68.8	117.7	114.4	112.7	112.0	107.2
Indiana	54.8	57.3	57.6	63.6	70.2	104.7	105.2	100.6	99.9	99.8
Iowa	25.7	28.2	28.5	33.1	32.6	123.0	116.5	112.9	110.8	107.8
Kansas	30.3	32.5	37.0	36.8	37.8	108.1	104.2	97.0	96.4	92.6
Louisiana	73.0	72.7	81.5	84.1	86.3	71.8	67.1	68.2	68.0	64.4
Maryland	80.6	90.4	95.7	98.9	104.6	118.7	116.0	111.6	111.5	109.8
Michigan	46.5	48.2	53.3	59.8	66.1	96.9	93.3	90.6	90.7	93.3
Minnesota	37.9	39.2	40.0	46.3	54.5	131.1	124.2	121.3	119.1	113.9
Mississippi	59.9	62.6	72.1	78.4	74.2	49.5	50.2	48.7	46.8	44.5
Montana	50.3	55.0	61.3	62.3	65.7	91.4	92.9	74.5	78.9	87.5
Nebraska	21.6	20.3	24.6	24.5	29.9	101.4	100.6	98.5	100.9	94.5
New Jersey	56.7	60.6	65.1	69.3	73.1	119.6	112.9	113.4	107.1	109.3
New York	59.0	61.3	66.4	71.0	74.8	127.6	124.1	123.8	122.7	121.8
North Carolina	64.3	65.5	69.4	74.7	83.3	50.0	46.2	48.2	47.9	51.2
Ohio	53.6	54.9	62.0	63.0	69.8	111.2	110.5	100.8	105.2	104.6
Pennsylvania	49.1	52.5	56.4	59.9	66.1	104.2	102.1	98.9	94.9	103.0
South Carolina	59.2	65.5	70.7	76.5	78.1	48.2	41.6	45.3	39.7	42.5
South Dakota	38.3	45.1	43.7	48.6	53.9	82.4	80.7	82.7	72.9	68.0
Tennessee	92.7	94.7	107.2	115.7	120.3	60.0	56.8	57.1	58.2	58.0
Virginia	77.3	81.0	87.0	85.0	91.4	72.3	67.9	64.3	61.6	62.8
West Virginia	53.8	55.4	59.8	65.4	68.0	67.5	62.0	57.7	59.4	57.9
Wisconsin	40.7	44.9	48.1	50.5	53.3	116.4	116.4	115.8	112.8	110.0
Hawaii	99.6	94.3	98.2	102.3	110.4	68.6	71.5	57.2	59.6	64.5
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	65.0	70.2	76.7	81.3	87.3	95.6	92.4	85.4	79.5	78.8

TABLE 4.—*Death rates for various causes per 100,000 population*—Continued

State	Diabetes mellitus (59)					Cerebral hemorrhage, apoplexy (82, a, b)				
	1933	1932	1931	1930	1929	1933	1932	1931	1930	1929
Total	21 5	21 7	20 3	19 1	18 8	79 2	79 3	78 5	78 9	79 6
Alabama	9 6	10 5	10 8	8 8	9 0	56 7	61 8	61 4	65 5	64 5
California	22 6	20 8	19 2	18 1	19 0	82 6	77 8	78 6	81 9	80 2
Connecticut	24 6	25 1	21 9	17 9	17 5	-----	-----	-----	-----	-----
District of Columbia	29 5	28 2	25 1	26 6	27 7	115 2	107 5	105 7	99 2	83 8
Georgia	11 7	11 6	10 9	11 6	10 2	72 6	80 0	84 8	90 1	81 8
Idaho	10 7	12 7	12 5	7 8	12 8	74 8	79 9	95 3	71 3	62 2
Illinois	26 1	26 3	25 6	22 1	23 5	72 4	73 0	73 0	74 7	76 0
Indiana	14 6	15 5	16 4	15 7	15 0	106 0	108 7	105 7	108 1	108 4
Iowa	19 5	16 0	19 8	21 0	18 4	112 1	109 0	111 2	93 8	97 1
Kansas	23 3	22 1	21 9	20 9	21 4	99 8	101 2	94 8	99 7	108 9
Louisiana	14 0	13 7	12 8	12 1	11 2	60 6	60 2	57 5	61 8	60 3
Maryland	23 6	25 7	23 0	21 3	19 5	95 1	112 6	108 6	105 1	102 0
Michigan	21 9	21 9	19 1	18 1	19 7	81 4	84 1	87 7	89 9	93 6
Minnesota	20 7	22 2	19 5	18 2	18 6	80 2	77 8	75 4	79 5	75 3
Mississippi	7 6	7 6	7 8	8 9	7 3	65 8	61 9	64 3	66 6	64 9
Montana	15 6	15 8	15 4	16 2	15 2	69 6	70 1	68 0	66 6	59 1
Nebraska	16 3	22 8	21 2	20 6	21 5	95 0	93 0	84 4	84 5	88 4
New Jersey	29 0	26 0	23 9	23 1	23 0	82 3	77 3	79 4	80 4	83 4
New York	30 3	29.9	28 2	26 9	26 2	52 9	51 5	52 0	53 2	57 4
North Carolina	10 7	10 7	10 6	10 0	9 9	-----	-----	-----	-----	-----
Ohio	23 2	24.2	21 7	21 7	20 7	106 9	110 3	109 1	107 7	112 0
Pennsylvania	26 1	25 7	24 7	21 9	22 3	83 4	85 7	87 0	87 1	88 7
South Carolina	8 3	11 1	10 3	8 9	8 6	-----	-----	-----	-----	-----
South Dakota	19 6	17 3	20 6	16 9	18 8	78 2	67 0	64 1	61 3	55 0
Tennessee	10 6	10 1	10 6	10 8	10 2	66 7	65 6	60 0	62 9	63 0
Virginia	14.8	15 8	14.9	14 3	11 9	96 6	91 0	97 7	95 8	89 4
West Virginia	11 4	13 0	11 7	12 5	9 7	68 5	76 1	67 9	63 7	49 3
Wisconsin	23 6	22 4	22 4	20 7	19 2	85 0	87 3	85 9	85 6	91 6
Hawaii	15 8	9 5	12 3	13 0	12 6	49 7	51 8	50 7	48 3	53 9
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over	24 4	23 3	21.4	18 7	18 6	64 5	62 9	61 3	61 3	------

State	Heart diseases (90–95)					Nephritis (130–132)				
	1933	1932	1931	1930	1929	1933	1932	1931	1930	1929
Total	224 8	219 5	211 7	209 6	215 1	80 8	84 4	83 7	88 0	90 7
Alabama	124.8	117 9	116.9	134 0	136 2	78 4	84 7	88 2	100 4	95 8
California	274 6	252 2	253 4	239 7	249 0	78 7	80 6	80 9	84 0	89 2
Connecticut	209 7	208 1	203 0	183 6	193 8	85 3	87 8	88 3	73 2	71 1
District of Columbia	342 2	330 6	300 2	315 9	325 5	128 9	140 4	146 2	160 4	162 6
Georgia	134.0	139 9	132 8	138 0	124.5	105 0	109 6	107 4	127 0	134 5
Idaho	161 8	161 2	159 7	174 6	153 1	35 3	43 3	38 7	39 2	61 3
Illinois	254 5	231.6	232 1	223 1	233 9	102 6	108 8	107 2	105 8	109 3
Indiana	177 0	174 0	167 9	182 5	197.4	73 1	69.7	74 3	84 9	80 9
Iowa	196 3	198 3	200 7	195 8	215 4	41 1	45 1	45 9	43 2	49 3
Kansas	194 0	178 0	153 9	171 5	163 7	93 9	100 0	95.3	102 7	90 5
Louisiana	188 0	182 5	178 0	199.1	191 9	95 9	102 5	108 6	112 0	108 2
Maryland	256 0	256 5	251 0	245.2	239 2	144 4	138 4	139 2	149.6	151 0
Michigan	226 8	217 9	204 4	229 6	245 8	59 6	57 8	58.8	63 7	66 1
Minnesota	198 3	193 6	177 9	173 4	155 3	54 8	54 7	50 8	52.2	56 2
Mississippi	97 0	84 2	94 3	104 3	97 2	63 7	68.7	84 7	97.1	95 6
Montana	178 8	158 7	139 6	139 4	169 2	68 7	71 4	66 7	73 1	68 0
Nebraska	175 9	171 4	159 1	159 4	166 0	57 3	72 0	67 9	58.6	68.5
New Jersey	269 0	231 0	234 3	232 1	246 0	86 0	91 0	96 3	102.2	99 5
New York	289 6	294 2	288 0	275 9	293 3	76 3	74 8	73 4	76 4	80.6
Ohio	236 8	237 5	220 3	225.3	227 1	76 9	78.6	74 0	78 4	84.7
Pennsylvania	248.3	238.4	233 5	231 6	236 2	93 9	93 0	92 7	104 3	104.8
South Carolina	-----	-----	-----	-----	-----	84 4	125 6	121 2	112.6	105 4
South Dakota	145 1	150 3	127 4	123 5	126 5	50.1	41 7	39 1	45 7	53.7
Tennessee	114.7	98.6	108 4	120.3	128.9	62.4	67 2	69 6	75 9	71.8
Virginia	192 5	198 3	188.3	178 2	176.7	89.2	119.5	101.5	108.3	103 0
West Virginia	117 0	113 0	110 6	116 6	112.7	78.6	68 8	64 5	61 3	64 3
Wisconsin	223 7	217 4	203 1	204.8	212.3	65 7	66 5	67 7	67 4	68 0
Hawaii	115.9	100.1	105 7	121 4	118 2	77.0	60.2	68.4	66.9	------
Industrial policyholders, Metropolitan Life Insurance Co., ages 1 and over, other (organic) heart only (95)	163.4	157 5	150.1	147.1	149 0	68 0	69.6	68.1	69 2	70.6

COURT DECISION ON PUBLIC HEALTH

Election by city council of trustees of sanitary district held not subject to veto by mayor.—(Minnesota Supreme Court; *State ex rel. Wenzel et al.* v. *May et al.*, 251 N.W. 529; decided Dec 15, 1933) Chapter 341 of the Minnesota Session Laws for 1933 had reference to the organization into a sanitary district of two or more contiguous first-class cities when there existed certain conditions concerning the discharge of sewage or industrial wastes into a common natural water course. Under this act the State board of health established a sanitary district embracing the contiguous cities of St Paul and Minneapolis, and the board's final order so doing was properly filed with the governing body of St. Paul and with the clerk of the district court of Ramsey County on August 22, 1933. Portions of section 4 of said chapter 341 read as follows

> The district shall be governed by a board of trustees who shall be appointed or selected as follows· Within 60 days after the filing of the order of the State board of health confirming the order creating said sanitary district, with the clerk of the district court of the county in which each city of the first class is located, * * * the city councils or other governing bodies of the cities within said sanitary district shall each elect one of its own members as trustees to said board and also one trustee from the citizenry of each city or county wherein such cities of the first class are located; * * * The city clerk of each such city shall immediately, upon the election of the two trustees by the city council of his city, file with the secretary of state a certified copy or copies of the resolution or resolutions of the city council of his city electing the said trustees * * * If the city council, or mayor, of any of said cities of the first class shall within the time specified herein fail to select, and cause to be certified, any of the trustees to be chosen as above provided, the governor shall thereupon select and appoint such trustees as have not been so designated. * * *

On October 17, 1933, the city council of St. Paul elected two trustees and a resolution to that effect was adopted. On October 20 the city clerk filed with the secretary of state a certified copy of the minutes of the city council as to the election and also a certified copy of the resolution of election, together with the oath of office of the two trustees. It appeared that the resolution, after its adoption was announced, was pocketed by the mayor, and on October 23 he returned it to the council with his purported veto, but the council on the same day repassed it over the veto. On the advice of the attorney general that the council had failed to elect two trustees within the time fixed by the statute, the governor appointed the relators herein as trustees. A quo warranto proceeding was brought by the attorney general on the relation of the plaintiffs, challenging the right and title to the office of trustee of each of the persons who had been elected by the city council.

The supreme court said that it was readily perceived that the claim of the relators depended on whether or not the mayor of St. Paul had

the power to veto the act of the city council of October 17 electing respondents trustees "If he is given no such power by chapter 341", said the court, "there can be no question as to the legality of respondents' election." It was pointed out that the said chapter placed the duty upon the city councils of the cities concerned to elect two trustees to the sanitary board created thereunder, and that neither by direct words nor by implication was there anything in the act which permitted a court to import that such election was subject to the mayor's approval or disapproval. It was concluded that respondents were the trustees, the opinion closing as follows

In our opinion respondents were duly elected to the office of trustees on the board of trustees of the sanitary district created by the State board of health, and the record of such election was duly filed as required by chapter 341, Laws 1933, on October 20 last, on which day respondents took and filed their oath of office

The offices herein controversy were then filled by respondents. Nothing has transpired since that day which could deprive them of their office. Hence the writ issued herein should be quashed.

It is so ordered.

DEATHS DURING WEEK ENDED APR. 14, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Apr 14, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	8,883	7,935
Deaths per 1,000 population, annual basis	12 4	11 1
Deaths under 1 year of age	674	547
Deaths under 1 year of age per 1,000 estimated live births	63	[1] 46
Deaths per 1,000 population, annual basis, first 15 weeks of year	12 6	12.1
Data from industrial insurance companies		
Policies in force	67,698,617	68,464,541
Number of death claims	14,298	12,859
Death claims per 1,000 policies in force, annual rate	11 0	9 8
Death claims per 1,000 policies, first 15 weeks of year, annual rate	11 1	11.0

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Apr. 21, 1934, and Apr. 22, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr 21, 1934, and Apr 22, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr 21, 1934	Week ended Apr 22 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933
New England States								
Maine	1	1		3	14	1	0	0
New Hampshire				1	167	4	1	0
Vermont					53	58	0	0
Massachusetts	14	25		5	1,953	445	2	0
Rhode Island		3	2		3	1	0	0
Connecticut	1	5	2	10	52	265	1	0
Middle Atlantic States								
New York	62	65	[1] 10	[1] 11	1,227	3,126	1	6
New Jersey	16	24	16	10	657	2,290	0	0
Pennsylvania	36	63			4,033	1,353	3	4
East North Central States								
Ohio	31	24	14	15	1,207	768	4	0
Indiana	15	17	14	18	1,073	205	1	2
Illinois	31	31	21	70	1,813	726	15	27
Michigan	17	17	1	6	251	986	2	0
Wisconsin	3	4	24	40	1,595	425	2	1
West North Central States								
Minnesota	3	2			231	1,051	0	0
Iowa [2]	11	10	4		240	14	0	2
Missouri	34	21	49	6	936	211	4	4
North Dakota	1	1			152	73	0	0
South Dakota	3	3			336	5	0	1
Nebraska	1	12	10		232	22	0	5
Kansas	9	14	2	1	510	339	0	0
South Atlantic States								
Delaware	1	7			102	7	0	1
Maryland [2]	9	6	8	8	1,909	15	0	1
District of Columbia	7	4	2	2	226	8	2	2
Virginia	18	17			1,400	341	2	2
West Virginia	19	10	64	13	89	65	8	0
North Carolina	16	12	17	21	2,298	525	1	1
South Carolina	7	7	372	273	708	286	0	0
Georgia [3]	6	5			592	85	1	0
Florida	9	7	2	2	1,187	97	0	0

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr 21, 1934, and Apr 22, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr 21, 1934	Week ended Apr 22, 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933
East South Central States								
Kentucky	9	9	6	25	185	128	1	1
Tennessee	5	11	39	52	816	69	0	0
Alabama [3]	17	13	53	36	881	58	1	1
Mississippi [2]	6	3					0	0
West South Central States								
Arkansas	1	5	7	21	65	305	3	0
Louisiana	18	12	6	2	349	55	1	1
Oklahoma [4]	5	6	39	28	240	195	0	4
Texas [3]	79	48	169	234	942	1,635	2	2
Mountain States								
Montana	1		110	1	40	42	0	0
Idaho [5]			2	6	36	48	0	0
Wyoming [5]	3				90	9	0	1
Colorado	3	4		31	352	8	1	0
New Mexico	2	2	2	1	162	10	0	1
Arizona	3		14		58	92	0	0
Utah			5		256	7	0	0
Pacific States								
Washington	5	2			196	55	2	1
Oregon [5]		3	37	31	87	87	0	0
California	42	42	36	19	942	1,229	3	4
Total	530	577	1161	1,002	30,943	17,829	64	75

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr 21, 1934	Week ended Apr 22, 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933
New England States								
Maine	0	0	11	34	0	0	1	3
New Hampshire	0	0	12	49	0	0	0	0
Vermont	0	0	11	12	0	0	0	0
Massachusetts	0	0	225	396	0	0	3	5
Rhode Island	0	0	22	32	0	0	0	0
Connecticut	0	0	91	118	0	2	0	1
Middle Atlantic States								
New York	0	0	874	703	0	0	8	12
New Jersey	0	2	212	331	0	0	4	3
Pennsylvania	0	1	741	840	0	0	11	3
East North Central States								
Ohio	1	1	796	724	0	3	5	7
Indiana	0	0	169	152	0	2	7	1
Illinois	2	3	610	469	5	12	4	9
Michigan	1	0	803	493	1	0	1	4
Wisconsin	0	0	242	137	50	19	2	3
West North Central States								
Minnesota	1	0	66	69	7	3	1	0
Iowa [3]	0	0	55	20	4	17	0	0
Missouri	1	0	95	101	7	3	8	0
North Dakota	0	0	24	12	0	0	0	1
South Dakota	0	0	4	16	6	0	1	1
Nebraska	1	0	49	49	2	1	0	0
Kansas	0	0	39	60	11	0	2	2
South Atlantic States								
Delaware	0	0	8	14	0	0	1	0
Maryland [3]	0	0	58	88	0	0	7	3
District of Columbia	0	0	14	15	0	0	1	0
Virginia	0	0	29	46	0	1	5	6
West Virginia	1	0	78	21	0	1	20	4
North Carolina	0	0	23	47	2	1	1	2
South Carolina	1	1	8	5	0	3	0	5
Georgia [3]	0	1	10	6	0	1	16	6
Florida	0	0	3	9	2	0	7	1

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr 21, 1934, and Apr 22, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr 21, 1934	Week ended Apr 22, 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933	Week ended Apr 21, 1934	Week ended Apr 22, 1933
East South Central States								
Kentucky	0	0	43	43	0	0	0	14
Tennessee	1	1	26	47	1	1	2	4
Alabama [3]	0	1	9	8	0	2	3	12
Mississippi [2]	0	0	8	4	1	0	1	3
West South Central States								
Arkansas	0	0	3	1	1	8	1	3
Louisiana	0	0	24	15	9	1	20	21
Oklahoma [4]	1	0	9	12	8	2	4	0
Texas [3]	0	0	81	69	36	23	14	6
Mountain States								
Montana	1	0	8	22	0	0	0	1
Idaho [5]	0	0	-------	0	9	5	0	1
Wyoming [5]	0	0	8	12	0	0	1	0
Colorado	0	0	31	22	0	3	2	0
New Mexico	0	0	22	10	0	0	4	4
Arizona	0	0	15	3	0	0	2	2
Utah	0	0	11	1	6	0	0	0
Pacific States								
Washington	0	0	31	47	3	22	4	0
Oregon [5]	0	0	50	30	9	2	1	1
California	10	3	213	165	2	63	6	7
Total	22	14	5,974	5,579	182	201	181	161

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended Apr 21, 1934, 14 cases, as follows Georgia, 3, Alabama, 2, Texas, 9
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended Apr 21, 1934, 13 cases, as follows Idaho, 1, Wyoming, 8; Oregon, 4

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1934										
West Virginia	2	108	271	-------	111	-------	4	351	4	20
February 1934										
Colorado	1	20	-------	-------	340	-------	3	227	27	7
West Virginia	2	73	298	-------	176	-------	1	310	2	14
March 1934										
Arkansas	1	27	289	57	2,496	60	5	33	5	10
Illinois	38	129	173	7	7,078	-------	4	2,886	11	12
Iowa	10	27	47	-------	884	1	1	352	37	3
Louisiana	1	113	48	34	1,116	4	0	96	8	44
Maine	-------	1	8	-------	109	-------	1	71	0	37
Michigan	5	70	23	3	521	-------	0	3,627	17	22
Minnesota	5	48	9	-------	1,331	-------	1	316	21	2
Missouri	16	241	1,053	50	6,285	-------	3	735	30	14
Montana	3	11	192	-------	188	-------	0	47	0	3
New Jersey	8	73	84	-------	2,404	-------	1	898	0	12
New Mexico	1	33	20	1	471	1	3	96	7	4
Ohio	10	129	321	-------	5,376	-------	9	4,085	2	10
Rhode Island	-------	7	2	-------	29	-------	0	70	0	0
Virginia	23	121	1,077	3	6,911	9	4	204	1	12
West Virginia	9	54	292	-------	351	-------	1	411	1	19

January 1934

	Cases
West Virginia	
Chicken pox	157
Dysentery	1
Mumps	23
Whooping cough	228

February 1934

Colorado	
Chicken pox	665
Impetigo contagiosa	67
Mumps	295
Septic sore throat	3
Undulant fever	1
Vincent's infection	1
Whooping cough	495
West Virginia	
Chicken pox	178
Mumps	24
Whooping cough	158

March 1934

Chicken pox	
Arkansas	73
Illinois	2,283
Iowa	307
Louisiana	125
Maine	253
Michigan	1,690
Minnesota	611
Missouri	804
Montana	222
New Jersey	2,014
New Mexico	57
Ohio	2,533
Rhode Island	143
Virginia	447
West Virginia	268
Dengue	
Arkansas	2
Diarrhea and enteritis	
Ohio (under 2 years)	18
Dysentery	
Illinois (amoebic)	45
Illinois (bacillary)	5
Illinois (amoebic carriers)	104
Iowa	4
Louisiana	3
Michigan	13
Minnesota (amoebic)	4
Minnesota (bacillary)	4
Missouri	20
New Jersey (amoebic)	2
New Mexico	1
Virginia (amoebic)	2
Dysentery and diarrhea	
Virginia	54
Favus.	
Montana	1
Food poisoning	
Ohio	26
German measles	
Illinois	390
Iowa	1,921
Maine	92
Montana	12
New Jersey	234
New Mexico	105

March 1934—Continued

German Measles—Continued	
Ohio	2,830
Rhode Island	1
Hookworm disease	
Louisiana	1
Impetigo contagiosa	
Iowa	3
Montana	12
Lead poisoning	
Illinois	6
New Jersey	1
Ohio	11
Leprosy	
Louisiana	1
Lethargic encephalitis	
Illinois	6
Iowa	1
Louisiana	2
Maine	2
Michigan	3
Minnesota	2
Missouri	3
Montana	1
Ohio	4
Virginia	4
Mumps	
Arkansas	190
Illinois	2,192
Iowa	367
Louisiana	7
Maine	15
Michigan	882
Missouri	930
Montana	5
New Jersey	419
New Mexico	38
Ohio	461
Rhode Island	6
Virginia	254
West Virginia	37
Ophthalmia neonatorum	
Arkansas	1
Illinois	2
Ohio	56
Virginia	2
Paratyphoid fever	
Arkansas	1
Illinois	1
Louisiana	1
Michigan	1
Ohio	1
Virginia	1
Puerperal septicemia	
Illinois	2
New Mexico	2
Ohio	1
Rabies in animals	
Illinois	38
Louisiana	11
Maine	3
Missouri	19
New Jersey	20
Rabies in man	
Louisiana	1
Missouri	1
Rocky Mountain spotted fever	
Montana	2
Scabies	
Montana	7

March 1934—Continued

Septic sore throat	
Illinois	27
Iowa	1
Louisiana	1
Maine	2
Michigan	64
Missouri	181
Montana	5
New Mexico	4
Ohio	356
Virginia	20
West Virginia	12
Tetanus	
Illinois	1
Louisiana	8
New Jersey	1
Ohio	1
Trachoma	
Arkansas	1
Illinois	4
Montana	2
New Jersey	5
Ohio	4
Trichinosis	
Illinois	2
Iowa	5
Michigan	9
Montana	1
New Jersey	1
Tularaemia	
Arkansas	1
Illinois	7
Louisiana	4
Minnesota	2
Ohio	1
Virginia	1
West Virginia	1
Undulant fever	
Arkansas	3
Illinois	6
Iowa	22
Louisiana	4
Maine	2
Michigan	6
Minnesota	6
Missouri	3
New Jersey	3
Ohio	7
Rhode Island	2
Virginia	1
Vincent's infection	
Illinois	55
Maine	3
Michigan	21
Whooping cough	
Arkansas	173
Illinois	1,961
Iowa	222
Louisiana	19
Maine	498
Michigan	1,163
Minnesota	248
Missouri	1,077
Montana	35
New Jersey	895
New Mexico	145
Ohio	2,765
Rhode Island	186
Virginia	399
West Virginia	319

PLAGUE-INFECTED GROUND SQUIRRELS IN KERN AND TULARE COUNTIES, CALIF.

The Director of Public Health of the State of California has reported that from March 28 to April 19, 1934, 31 lots of ground squirrels (including 125 animals) from Kern and Tulare Counties, in the interior of California, were found to be plague infected. The diagnosis has been confirmed by animal inoculation for some of the lots

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr 14, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	1	------	0	2	2	1	0	1	0	6	29
New Hampshire											
Concord	0	------	0	16	0	1	0	1	0	1	11
Nashua	0	------	------	3	------	6	0	------	0	0	------
Vermont											
Barre	0	------	0	0	2	0	0	0	0	0	6
Burlington	0	------	0	0	0	1	0	0	0	11	7
Massachusetts											
Boston	8	------	2	369	27	63	0	14	0	79	246
Fall River	0	------	1	0	1	4	0	1	0	11	26
Springfield	0	------	0	3	2	8	0	0	0	23	40
Worcester	0	------	0	1	10	14	0	2	0	7	44
Rhode Island											
Pawtucket	------	------	------	------	------	------	------	------	------	------	25
Providence	0	------	0	1	7	11	0	1	0	8	63
Connecticut											
Bridgeport	0	1	1	2	4	8	0	2	0	0	35
Hartford	0	1	0	0	5	11	0	1	0	0	33
New Haven	0	1	0	1	3	2	0	0	0	7	39
New York											
Buffalo	5	------	1	109	31	13	0	6	0	23	161
New York	53	11	5	155	206	298	0	87	4	113	1,654
Rochester	3	------	0	1	3	40	0	2	0	14	66
Syracuse	0	------	0	9	2	3	0	1	0	58	52
New Jersey											
Camden	1	1	0	90	2	8	0	1	0	3	38
Newark	0	4	0	8	10	33	0	8	0	40	106
Trenton	0	2	0	46	1	13	0	3	0	0	29
Pennsylvania											
Philadelphia	2	8	7	762	64	131	0	31	1	56	526
Pittsburgh	9	8	5	236	37	25	0	5	0	46	173
Reading	1	------	0	1	0	6	0	1	0	9	33
Scranton	0	------	------	3	------	1	0	------	0	1	------
Ohio											
Cincinnati	3	------	2	15	14	39	0	8	0	12	132
Cleveland	2	32	2	98	38	155	0	12	0	157	241
Columbus	1	3	3	2	5	57	0	9	0	45	89
Toledo	1	------	0	75	15	32	0	0	0	131	75
Indiana											
Fort Wayne	6	------	0	11	1	13	0	1	6	4	34
Indianapolis	2	------	0	375	17	20	1	5	0	75	------
South Bend	0	------	0	3	1	5	0	0	0	0	22
Terre Haute	2	------	0	0	3	2	0	0	0	0	23
Illinois											
Chicago	1	2	2	374	67	274	0	37	0	185	750
Cicero	0	------	0	0	1	0	0	0	0	0	6
Springfield	0	1	0	119	4	0	0	1	0	16	22
Michigan											
Detroit	9	1	1	83	37	151	0	14	0	148	294
Flint	0	------	1	8	19	104	0	0	0	10	62
Grand Rapids	0	------	1	1	4	33	0	1	0	2	35
Wisconsin											
Kenosha	0	------	0	1	0	18	0	0	0	5	11
Milwaukee	1	------	0	49	5	97	0	5	0	59	104
Racine	0	------	0	1	0	4	1	0	0	4	7
Superior	0	------	0	0	0	0	0	0	0	1	9
Minnesota											
Duluth	0	------	0	0	5	1	0	2	0	0	26
Minneapolis	5	------	1	9	10	16	0	1	0	42	105
St Paul	0	------	0	14	4	11	0	7	0	31	71
Iowa											
Des Moines	3	------	------	0	------	15	0	------	0	0	33
Sioux City	0	------	------	1	------	0	0	------	0	5	------
Waterloo	0	------	------	0	------	0	0	------	0	13	------
Missouri											
Kansas City	2	------	0	4	15	9	0	5	0	26	95
St Joseph	2	------	0	15	2	1	0	0	0	0	10
St Louis	21	1	1	56	19	26	8	4	1	87	218

City reports for week ended Apr 14, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Dakota											
Fargo	0	--	0	24	0	0	0	0	0	7	10
Grand Forks	0	--	--	0	--	0	0	--	0	1	--
South Dakota											
Aberdeen	0	--	--	33	--	0	0	--	0	11	--
Sioux Falls	3	--	--	6	--	1	0	--	0	0	7
Nebraska											
Omaha	1	--	0	188	5	14	3	3	0	11	54
Kansas											
Topeka	0	--	1	4	3	3	0	3	0	40	21
Wichita	1	--	0	36	3	7	0	0	0	38	25
Delaware											
Wilmington	1	--	0	92	5	2	0	0	1	7	34
Maryland											
Baltimore	1	5	2	1,488	35	44	0	12	0	201	270
Cumberland	0	--	0	2	0	2	0	1	0	0	9
Frederick	--	--	--	--	--	--	--	--	--	--	--
District of Columbia											
Washington	11	--	0	329	18	14	0	9	2	41	169
Virginia											
Lynchburg	1	--	0	5	0	0	0	0	0	11	9
Norfolk	0	--	0	31	3	1	0	1	0	0	39
Richmond	0	--	0	262	4	2	0	3	0	0	54
Roanoke	1	--	0	6	0	1	0	0	0	1	20
West Virginia											
Charleston	2	2	1	1	2	0	0	1	0	0	35
Huntington	2	--	--	0	--	21	0	--	0	0	--
Wheeling	0	--	0	5	2	14	0	0	0	6	21
North Carolina											
Raleigh	0	--	0	2	2	0	0	1	0	19	21
Wilmington	0	--	0	4	0	0	0	1	1	2	10
Winston-Salem	0	1	0	10	3	4	0	2	0	0	20
South Carolina											
Charleston	0	17	0	29	7	0	0	2	0	3	38
Columbia	0	--	0	0	2	0	0	0	0	0	31
Greenville	0	--	0	1	5	0	0	0	1	1	9
Georgia											
Atlanta	1	4	2	74	5	6	0	2	0	1	77
Brunswick	0	--	0	26	1	0	0	0	1	0	2
Savannah	1	60	0	46	1	1	0	0	0	0	29
Florida											
Miami	1	--	0	90	2	0	0	2	0	1	23
Tampa	5	2	2	196	0	0	0	1	0	0	28
Kentucky											
Ashland	0	--	--	41	--	1	0	--	0	2	--
Lexington	2	--	0	0	2	1	0	4	0	10	22
Louisville	11	3	0	27	11	23	0	2	0	45	85
Tennessee											
Memphis	2	--	4	81	14	3	0	6	0	6	87
Nashville	0	--	0	7	6	0	0	1	0	6	55
Alabama											
Birmingham	0	1	0	110	7	4	0	4	2	2	49
Mobile	0	3	3	6	1	0	0	0	0	0	16
Montgomery	4	1	--	67	--	1	0	--	0	4	--
Arkansas											
Fort Smith	0	--	--	1	--	1	0	--	0	0	--
Little Rock	0	--	0	27	2	1	0	1	0	0	3
Louisiana											
New Orleans	12	4	1	34	9	14	0	7	2	1	136
Shreveport	1	--	0	14	4	0	0	0	0	0	41
Oklahoma:											
Oklahoma City	2	10	1	14	15	2	0	5	0	0	59
Texas:											
Dallas	8	1	1	6	1	5	4	5	0	10	56
Fort Worth	1	--	0	3	3	3	0	1	2	10	35
Galveston	1	--	0	0	1	0	0	1	0	0	16
Houston	11	--	0	8	7	3	1	8	1	0	69
San Antonio	2	--	0	3	7	3	0	11	0	0	68
Montana:											
Billings	0	1	0	0	0	2	0	0	0	3	8
Great Falls	0	--	0	7	2	0	0	0	0	2	9
Helena	0	--	0	0	0	1	0	0	0	0	3
Missoula	0	--	0	0	0	0	0	0	0	0	4

City reports for week ended Apr 14, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Idaho											
Boise	0	------	--------	18	-------	2	-------	0	0	1	4
Colorado											
Denver	2	49	0	106	7	19	2	4	0	91	79
Pueblo	0	------	0	8	1	1	0	1	0	28	10
New Mexico											
Albuquerque	0	------	0	27	1	2	0	4	0	5	17
Utah											
Salt Lake City	0	------	0	100	1	10	1	0	0	61	24
Nevada											
Reno	0	------	0	0	0	0	0	0	0	0	2
Washington											
Seattle	0	------	0	6	6	12	2	4	0	62	80
Spokane	0	------	0	22	2	1	1	0	0	25	25
Tacoma	------	------	--------	------	------	------	------	------	------	------	--------
Oregon											
Portland	1	------	0	11	4	11	1	2	0	23	73
Salem	0	1	--------	0	-------	2	0	-------	0	0	--------
California											
Los Angeles	14	21	1	59	10	75	0	28	1	94	298
Sacramento	1	------	0	7	5	5	0	2	1	2	28
San Francisco	0	2	0	160	6	15	0	12	0	29	167

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts			
Springfield	1	0	0
Connecticut			
Hartford	1	0	0
New York			
New York	0	0	1
New Jersey			
Newark	2	0	0
Pennsylvania			
Philadelphia	1	1	0
Ohio			
Cleveland	0	1	0
Indiana			
Indianapolis	1	0	0
Terre Haute	[1] 1	1	0
Illinois			
Chicago	5	2	0
Missouri			
St Joseph	2	0	0
St Louis	1	1	0

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
North Dakota			
Fargo	0	1	0
Tennessee			
Memphis	0	1	0
Arkansas			
Fort Smith	1	0	0
Texas			
Dallas	1	1	0
Colorado			
Denver	1	0	0
Washington			
Seattle	0	0	1
Oregon			
Portland	0	0	1
California			
Los Angeles	0	0	2
Sacramento	1	1	0
San Francisco	0	1	1

[1] Nonresident

Lethargic encephalitis —Cases Fall River, 1, Philadelphia, 1, Cleveland, 1, Chicago, 1, Birmingham, 1, San Francisco, 1

Pellagra —Cases Raleigh, 1, Charleston, S C , 3, Atlanta, 1, Louisville, 1, Birmingham, 1, Dallas, 1.

Typhus fever —Savannah, Ga , 1 case

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended April 7, 1934.—During the 2 weeks ended April 7, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis		1			1	1	1		1	5
Chicken pox		5		118	279	37	37	17	43	536
Diphtheria		2	12	27	7	14	11	6		79
Dysentery				1	2				1	4
Erysipelas				16	10	8	2	2		38
Influenza		63		1	21	2		16	37	140
Lethargic encephalitis				1	1					2
Measles		4	1	275	100	962	224	3	21	1,590
Mumps		3			420	13	14	4	77	531
Paratyphoid fever					4				1	5
Pneumonia	5	18			36		2		15	76
Poliomyelitis					1			1	1	3
Scarlet fever	2	26	7	136	328	30	27	10	194	760
Trachoma						4	12		7	23
Tuberculosis	2	2	11	96	64	22	16	9	40	262
Typhoid fever			2	54	12	2	3	2	4	79
Undulant fever				1	1					2
Whooping cough		22		213	503	21	46	8	9	822

CUBA

Provinces—Notifiable diseases—4 weeks ended March 24, 1934.—During the 4 weeks ended March 24, 1934, cases of certain notifiable diseases were reported in the provinces of Cuba, as follows:

Disease	Pinar del Rio	Habana	Matanzas	Santa Clara	Camaguey	Oriente	Total
Cancer	1	3		11		1	16
Chicken pox		4	8	5	4	4	25
Diphtheria		12	3				15
Hookworm disease		2		4			6
Leprosy			1	3		2	6
Malaria	106	6	15	281	28	910	1,355
Measles		10		2		1	13
Tetanus, infantile				1			1
Tuberculosis	16	44	29	219	12	19	339
Typhoid fever	9	10	7	24	8	12	70

POLAND

Vital statistics—1933—The central office of statistics of Poland has published the following vital statistics for 1933

Number of marriages	273, 874
Marriages per 1,000 inhabitants	8 3
Number of live births	868, 675
Live births per 1,000 inhabitants	26 5
Total deaths	466, 210
Deaths per 1,000 inhabitants	14. 2
Infant deaths	111, 229
Deaths of infants per 100 live births	12 8

VIRGIN ISLANDS

Notifiable diseases—January–March 1934—During the months of January, February, and March 1934, cases of certain notifiable diseases were reported in the Virgin Islands, as follows

Disease	January 1934	February 1934	March 1934	Disease	January 1934	February 1934	March 1934
Chicken pox			2	Syphilis	9	6	14
Filariasis	1	3	2	Tetanus		1	
Gonorrhea	6	7	5	Tuberculosis	6	3	1
Hookworm disease	2	4	6	Typhoid fever		11	
Malaria	65	[1] 45	60	Whooping cough	1		
Pellagra	3	1	1				

[1] Includes 3 imported cases

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Apr 27, 1934, pp 541–554 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued May 25, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands—No cholera was reported in the Philippine Islands during the week ended April 21, 1934.

Plague

United States—California—From March 28 to April 19, 1934, 19 lots with a total of 72 plague-infected ground squirrels were reported in Kern County, and 12 lots with a total of 53 plague-infected ground squirrels were reported in Tulare County, Calif. (See p. 574.)

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 19

MAY 11 - - - - - 1934

IN THIS ISSUE

Summary of Current Prevalence of Communicable Diseases
Report on a Psittacosis Outbreak in a Department Store
Deaths in Large Cities During the Week Ended April 21
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - - Price 5 cents
Subscription price, $2 a year

PUBLIC HEALTH REPORTS

VOL. 49 | MAY 11, 1934 | NO. 19

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES [1]

March 25–April 21, 1934

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease."

Measles.—The number of cases of measles continued to increase. For the 4-week period ended April 21 there were 132,389 cases reported, which was the highest incidence for this period in the recent years for which data are available. In 1933, 1932, and 1931 the numbers of cases for this period were 72,322, 61,868, and 80,856, respectively. Each geographic area, except the South Atlantic and East South Central, showed about the same rate of increase as was shown for the total reporting area. In the South Atlantic States the number of cases (34,745) was 5.5 times that for the corresponding period last year, and in the East South Central the number (9,032) was almost 10 times last year's figure.

Poliomyelitis.—For the 4 weeks ended April 21 there were 91 cases of poliomyelitis reported—an increase of 25 percent over the preceding 4 weeks. The current incidence was the highest for this period in recent years. Each geographic area, except the Middle Atlantic and East North Central, contributed to the increase. In those areas the current incidence was approximately the same as last year. In all other areas, while the number of cases was not large, the current incidence was more than twice that for the corresponding period last year. The largest number of cases (34) was reported from the Mountain and Pacific area. California reported 25 of these cases.

[1] From the Office of Statistical Investigations, U S Public Health Service The numbers of States included for the various diseases are as follows Typhoid fever, 48, poliomyelitis, 48; meningococcus meningitis, 48; smallpox, 48; measles, 47, diphtheria, 48, scarlet fever, 48, influenza, 43 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers

Scarlet fever.—The incidence of scarlet fever compared very favorably with recent years. For the current period the number of cases reported was 24,914, as against 26,299, 24,560, and 22,210 for the corresponding period in the years 1933, 1932, and 1931. The disease was considerably less prevalent than in preceding years in the three areas along the Atlantic Coast; all other areas closely approximated last year's incidence at this time.

Diphtheria.—The number of cases of diphtheria reported for the current period was 2,523, which was the same as reported for this period last year. The numbers of cases were 3,248 and 3,478 for the corresponding period in the years 1932 and 1931, respectively. The West North Central, South Central, and South Atlantic sections reported slight increases over last year's figure, while in the New England and Middle Atlantic, East North Central and far Western areas the disease seemed to be less prevalent.

Smallpox.—The incidence of smallpox, as compared with that for recent years, remained favorable. The number of cases reported for the current period was 656, or about 80 percent of last year's figure for the corresponding period. The New England and Middle Atlantic areas were free from smallpox, and the Mountain and Pacific sections reported a 50 percent decrease from last year's figure. Other areas closely approximated last year's incidence. For this period in 1932, 1931, and 1930 the numbers of cases for the whole reporting area were 1,530, 4,068, and 6,360, respectively.

Meningococcus meningitis.—For the 4 weeks ended April 21 there were 249 cases of meningococcus meningitis reported, about 73 percent of the figure for the corresponding periods in 1933 and also in 1932. This favorable comparison was characteristic of all areas except the South Atlantic. Of the 41 cases reported from that area, which was 1.4 times that for the corresponding period last year, Virginia reported 17 cases and West Virginia 15. For the country as a whole, the current incidence was the lowest for this period in recent years.

Typhoid fever.—During the 4 weeks ended April 21 there were 63 cases of typhoid fever reported from Maine as against 3 for the corresponding period last year, and 35 cases from Pennsylvania as compared with 3 for last year. The 63 cases in Maine occurred in Augusta. Reports from Pennsylvania do not show an unusual outbreak in any special locality. California and Washington, in the Pacific area, also reported significant increases over last year. Other areas reported a very favorable typhoid fever situation. For the entire reporting area the number of cases for the current period totaled 624, as compared with 609, 664, and 513 for the corresponding period in the years 1933, 1932, and 1931.

Influenza.—Influenza continued to decline during the current 4-week period. The total number of cases (7,139) was, however, 1.3 times

that for the corresponding period last year. Exclusive of the years 1931 and 1932, when minor influenza epidemics were in evidence, the current incidence was the highest for this period in the recent years for which data are available. In the New England and Middle Atlantic and East North Central areas the current incidence fell considerably below that of last year, but all other areas reported increases In the West North Central section the number of cases (389) was 4.3 times last year's figure, and in the Mountain and Pacific area the number (1,198) was 2 4 times that of last year. The South Atlantic and South Central areas approximated last year's incidence.

Mortality, all causes.—The average mortality rate from all causes in large cities, for the 4 weeks ended April 21, as reported by the Bureau of the Census, was 12 4 per 1,000 inhabitants (annual basis). During the 3 preceding years the rates for the corresponding periods were 11.3, 12.5, and 12.9, respectively. The current mortality, therefore, is high in relation to last year, but compares very favorably with that for the years 1932 and 1931. During the preceding 4 weeks of the current year the rate was 12.8.

PSITTACOSIS OUTBREAK IN A DEPARTMENT STORE IN PITTSBURGH

By L F Badger, *Passed Assistant Surgeon, United States Public Health Service*

During the winter of 1929–30 an outbreak of psittacosis occurred among the employees of a department store in Toledo, Ohio (in which 22 known cases developed), following the arrival of a shipment of parrots from a New York importer.

A similar outbreak occurred among the employees of a department store in Pittsburgh, Pa., during the months of February and March 1934, to which the attention of the city health department was attracted by the unusual number of cases of pneumonia reported as occurring among employees of the store.

HISTORIES OF THE BIRDS

Parakeets.—A shipment of 130 parakeets was received from a California aviary during the latter part of January. Four of these birds were dead on arrival, and 8 or 10 died soon thereafter. Other birds of the shipment were ill

Macaws.—One macaw was received about the time that the parakeets arrived and was soon sold. Another macaw was received from a New York dealer approximately 2 weeks later; and 2 weeks after its arrival this macaw became ill and was killed and sent to the United States Public Health Service for examination. The examina-

tion revealed the findings found in birds infected with psittacosis. That this macaw was well on arrival and did not become ill until after 2 weeks of proximity to the sick parakeets suggests that it became infected from the parakeets.

HUMAN CASES

In a total of 37 cases of illness among the employees a definite diagnosis of psittacosis was made in 10 and of suspected psittacosis in 27 Of the 10 definitely diagnosed as psittacosis, 4 died, autopsies on 3 of whom revealed the findings seen in psittacosis Of the 27 suspected cases, 8 were diagnosed pneumonia, of whom 7 died, and 19 as suspected psittacosis only, of which number 2 died Among the total of 37 cases there occurred 13 deaths, a mortality rate of 35.1 percent This rather high mortality rate suggests either an extremely virulent outbreak or that cases of the disease had been missed From the procedures carried out by the health department it is believed that but few cases were missed, as each employee absent from work for 48 hours was seen by a medical inspector.

With a history of contact with sick birds of the psittacine family, with 10 other employees having illnesses definitely diagnosed as psittacosis, with a death rate of 33.3 percent, and with a death rate of 87 5 percent of those diagnosed as pneumonia, there is little doubt that the 27 cases of suspected psittacosis were actually cases of psittacosis.

These 37 cases of illness developed among approximately 500 employees of the department store and occurred not only among those employed on the floor on which the birds were kept but among those from other floors. Employees from other floors of the store visited the birds, and these employees came in more or less direct contact with them.

SUMMARY

During the past 4 years 2 rather extensive outbreaks of psittacosis have occurred among employees of department stores in which pet shops were maintained. The first resulted from infected birds which had been imported into the country and the second from birds raised at an aviary in California.

COURT DECISION ON PUBLIC HEALTH

Divorce on ground of extreme cruelty denied wife where evidence showed existence of venereal disease in husband with mere request by him for sexual intercourse.—(Delaware Superior Court; *Bowman* v. *Bowman*, 171 A. 444; decided Feb. 23, 1934.) A statutory ground of divorce in Delaware was "extreme cruelty, on the part of either

husband or wife, such as to endanger the life or health of the other party or to render cohabitation unsafe." In a divorce action by a wife there was presented to the court the question of whether the existence of a venereal disease in the husband, accompanied by his mere request for sexual intercourse, constituted extreme cruelty. Because there had been no communication of the disease nor any demand for intercourse accompanied with a degree of insistence sufficient to indicate an intention to accomplish the desire against the wife's will, the court took the view that the charge of extreme cruelty had not been made out. Said the court: "A mere request for intercourse by the infected defendant, the denial of which by the petitioner was immediately concurred in by the defendant, does not, in my opinion, constitute extreme cruelty, under the statute, sufficient to authorize a decree of divorce."

DEATHS DURING WEEK ENDED APRIL 21, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Apr 21, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	8,768	7,920
Deaths per 1,000 population, annual basis	12 2	11.0
Deaths under 1 year of age	625	557
Deaths under 1 year of age per 1,000 estimated live births	58	[1] 48
Deaths per 1,000 population, annual basis, first 16 weeks of year	12.6	12 1
Data from industrial insurance companies		
Policies in force	67,712,710	68,438,649
Number of death claims	14,007	13,598
Death claims per 1,000 policies in force, annual rate	10 8	10.4
Death claims per 1,000 policies, first 16 weeks of year, annual rate	11 1	11.0

[1] Data for 81 cities

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended Apr. 28, 1934, and Apr. 29, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr 28, 1934, and Apr 29, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933
New England States								
Maine	1	1		2	12	4	1	0
New Hampshire					194	1	0	0
Vermont					60	5	0	0
Massachusetts	12	21		3	2,105	578	3	2
Rhode Island		2			12	1	0	0
Connecticut	3	7		5	71	273	1	0
Middle Atlantic States								
New York	52	54	[1] 10	[1] 15	965	3,632	2	3
New Jersey	12	20	23	7	728	1,869	1	3
Pennsylvania	66	41			4,304	1,117	4	0
East North Central States								
Ohio	22	39	80	111	1,357	577	2	2
Indiana	17	13	13	32	973	217	0	3
Illinois	59	21	17	13	1,900	704	8	19
Michigan	12	18	2	3	258	1,107	0	4
Wisconsin	3	5	39	38	2,202	429	0	1
West North Central States								
Minnesota	8	3			231	848	1	1
Iowa [2]	10	8	8		174	57	6	4
Missouri	44	32	103	28	765	228	3	3
North Dakota	2				242	26	0	2
South Dakota	2	1			332	12	0	0
Nebraska	5	8	2		351	55	2	0
Kansas	3	7	8		684	341	0	0
South Atlantic States								
Delaware	1				100	6	0	0
Maryland [2]	4	3	12	11	2,338	15	0	0
District of Columbia	9	3			171	11	0	0
Virginia	15	11			1,310	279	0	3
West Virginia	16	5	15		77	106	1	1
North Carolina	11	25	81	22	2,125	821	1	3
South Carolina	7	9	350	269	571	266	0	0
Georgia [3]	6	6			373	144	0	2
Florida [3]	5	9		2	932	88	0	0

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr 28, 1934, and Apr 29, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933
East South Central States								
Kentucky	11	7	31		711	105	0	0
Tennessee	4	6	28	61	514	63	1	2
Alabama [3]	13	3	43	49	609	135	3	0
Mississippi [2]	12	4					0	0
West South Central States								
Arkansas	8	10	5	8	89	475	2	2
Louisiana	16	8	9	1	302	41	0	0
Oklahoma [4]	6	10	47	24	420	65	1	1
Texas [3]	56	57	218	323	1,034	1,642	3	2
Mountain States								
Montana [5]	1	1	75		58	17	1	0
Idaho			1		32	18	0	0
Wyoming [5]	1	2			113	17	0	1
Colorado	3	1		29	449	10	1	0
New Mexico	7	4	3		159	24	1	0
Arizona			9		39	77	2	0
Utah			2		216	4	0	0
Pacific States								
Washington	2	2			167	93	0	0
Oregon [5]	1	5	26	35	86	85	0	0
California	44	47	26	36	751	1,315	1	4
Total	592	542	1,292	1,127	31,666	18,333	52	68

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933
New England States								
Maine	0	0	9	18	0	0	2	0
New Hampshire	0	0	7	27	0	0	0	0
Vermont	0	0	5	6	0	0	37	0
Massachusetts	1	0	217	365	0	0	3	2
Rhode Island	0	0	26	24	0	0	0	1
Connecticut	0	0	58	134	0	9	0	1
Middle Atlantic States								
New York	1	1	938	762	0	0	11	14
New Jersey	1	0	207	223	0	0	3	3
Pennsylvania	1	1	746	820	0	0	13	9
East North Central States								
Ohio	0	2	866	1,194	0	5	3	7
Indiana	0	1	140	153	0	7	6	1
Illinois	1	0	568	411	3	4	4	5
Michigan	0	1	855	668	3	1	3	1
Wisconsin	0	2	193	125	31	1	0	1
West North Central States								
Minnesota	0	0	52	96	8	0	2	1
Iowa [2]	0	0	64	29	15	16	0	0
Missouri	0	0	86	88	2	4	3	3
North Dakota	0	1	19	1	0	0	3	0
South Dakota	0	0	3	5	5	0	0	1
Nebraska	0	0	44	32	15	2	0	0
Kansas	0	0	76	47	0	1	0	1
South Atlantic States								
Delaware	0	0	7	15	0	0	0	0
Maryland [2]	0	0	61	94	0	0	1	4
District of Columbia	0	0	11	12	0	0	0	0
Virginia	0	1	28	52	1	0	6	4
West Virginia	0	0	104	25	0	2	6	2
North Carolina	0	1	31	63	3	0	2	7
South Carolina	0	1	9	1	3	0	6	5
Georgia [3]	0	0	4	6	1	0	9	7
Florida [3]	0	0	4	7	0	0	1	5

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended Apr 28, 1934, and Apr 29, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933	Week ended Apr 28, 1934	Week ended Apr 29, 1933
East South Central States								
Kentucky	1	1	46	55	0	1	8	12
Tennessee	0	0	11	45	1	1	13	3
Alabama [3]	0	0	3	13	2	2	7	3
Mississippi [2]	1	0	2	4	0	0	7	3
West South Central States								
Arkansas	0	0	9	3	2	4	0	1
Louisiana	0	1	15	7	6	0	18	15
Oklahoma [4]	0	0	9	9	6	8	8	8
Texas [3]	0	1	82	41	46	67	16	9
Mountain States								
Montana [5]	0	0	18	14	0	0	2	2
Idaho	0	0	1	1	0	3	0	0
Wyoming [5]	0	0	9	18	0	0	0	0
Colorado	0	0	16	21	1	1	1	0
New Mexico	0	0	12	11	0	0	3	3
Arizona	1	0	23	12	0	0	0	0
Utah	0	0	4	2	0	0	0	0
Pacific States								
Washington	1	0	33	36	15	25	5	1
Oregon [5]	0	1	27	19	13	6	0	2
California	11	0	212	128	2	32	7	3
Total	20	16	5,970	5,945	184	202	219	150

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended Apr 28, 1934, 6 cases, as follows Georgia, 2, Florida, 1, Alabama, 1, Texas, 2
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended Apr 28, 1934, 20 cases, as follows Montana, 7, Wyoming, 8, Oregon, 5

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
January 1934										
Tennessee	10	89	483	50	1,961	5	3	274	1	33
February 1934										
New Hampshire			3				0	90	1	0
March 1934										
Alabama	4	104	596	61	3,867	31	2	47	5	8
California	9	163	168	3	5,610	5	18	901	25	32
Florida		21	18	4	1,233	5	1	12	0	14
Georgia	3	63	902	91	8,885	27	1	40		34
Idaho	2	17	2		811		3	16	45	
Indiana	8	83	202		3,803		1	1,599	7	14
Kansas	4	40	31		1,317		1	408	10	5
Mississippi	1	26	4,203	2,349	13,596	269	0	60	7	22
Nevada			6		260		0	7	0	0
New Hampshire		1						54		0
North Carolina	3	85	283		13,540	27	2	168	1	8
Oklahoma [1]	6	65	446	31	3,221			105	15	19
Puerto Rico		44	61	2,327	86		2		0	29
South Carolina		161	3,754	447	3,140	150	0	30	10	18
Texas	19	524	3,074	905		32	2	587		62
Washington	4	15	85	1	804		6	272	35	12
Wisconsin	14	32	297		7,114		3	1,356	150	

[1] Exclusive of Oklahoma City and Tulsa.

January 1934

	Cases
Tennessee	
Chicken pox	252
Dysentery	6
German measles	16
Impetigo contagiosa	5
Lethargic encephalitis	5
Mumps	146
Ophthalmia neonatorum	4
Puerperal septicemia	3
Scabies	1
Septic sore throat	7
Tetanus	2
Trachoma	17
Vincent's infection	2
Whooping cough	135

March 1934

	Cases
Actinomycosis	
California	1
Anthrax	
Puerto Rico	1
Chicken pox	
Alabama	274
California	2,726
Florida	274
Georgia	379
Idaho	8
Indiana	375
Kansas	583
Mississippi	775
Nevada	48
North Carolina	783
Oklahoma [1]	112
Puerto Rico	207
South Carolina	205
Washington	498
Wisconsin	2,245
Diarrhea	
South Carolina	381
Dysentery	
Alabama (amoebic)	2
California (amoebic)	36
California (bacillary)	10
Florida	1
Georgia (amoebic)	10
Georgia (bacillary)	3
Indiana (amoebic)	1
Kansas (amoebic)	7
Mississippi (amoebic)	76
Oklahoma [1]	4
Puerto Rico	63
Washington (amoebic)	7
Filariasis	
Puerto Rico	6
Food poisoning	
California	61
German measles	
Alabama	550
California	822
Kansas	359
North Carolina	17
Washington	31
Wisconsin	988
Granuloma, coccidioidal	
California	7

March, 1934—Continued

	Cases
Hookworm disease	
Georgia	240
Mississippi	204
South Carolina	80
Impetigo contagiosa	
Kansas	4
Washington	2
Leprosy	
California	1
Puerto Rico	2
Lethargic encephalitis	
Alabama	4
California	4
Kansas	10
Oklahoma [1]	1
South Carolina	8
Texas	4
Washington	3
Wisconsin	2
Mumps	
Alabama	199
California	2,490
Florida	80
Georgia	252
Idaho	21
Indiana	79
Kansas	830
Mississippi	756
Nevada	1
Oklahoma [1]	79
Puerto Rico	43
South Carolina	328
Washington	711
Wisconsin	201
Ophthalmia neonatorum	
Alabama	2
Puerto Rico	4
South Carolina	13
Wisconsin	4
Paratyphoid fever	
California	1
Georgia	1
Idaho	1
Kansas	1
North Carolina	2
Puerto Rico	1
South Carolina	3
Texas	2
Psittacosis	
California	1
Puerperal septicemia	
Mississippi	11
Puerto Rico	4
Washington	1
Rabies in animals:	
Alabama	107
California	83
Indiana	34
Mississippi	4
South Carolina	38
Washington	10
Rabies in man	
Georgia	1
Rocky mountain spotted fever	
Idaho	1
Scabies	
Oklahoma [1]	8

March, 1934—Continued

	Cases
Septic sore throat	
California	21
Georgia	125
Kansas	2
Nevada	3
North Carolina	8
Oklahoma [1]	16
Washington	1
Tetanus	
Alabama	5
California	4
Kansas	1
Oklahoma [1]	1
Puerto Rico	13
South Carolina	1
Washington	1
Tetanus, infantile	
Puerto Rico	11
Trachoma	
California	12
Mississippi	9
Oklahoma [1]	3
Puerto Rico	57
Washington	1
Wisconsin	4
Trichinosis	
California	2
Tularaemia	
Alabama	4
California	1
Georgia	11
Indiana	1
North Carolina	2
South Carolina	6
Typhus fever	
Alabama	19
California	1
Georgia	20
North Carolina	1
Undulant fever	
Alabama	2
California	7
Georgia	7
Kansas	7
North Carolina	1
Oklahoma [1]	1
South Carolina	3
Washington	1
Wisconsin	6
Vincent's infection	
Kansas	8
Oklahoma [1]	1
Whooping cough	
Alabama	339
California	1,541
Florida	68
Georgia	344
Idaho	11
Indiana	299
Kansas	787
Mississippi	2,099
Nevada	11
North Carolina	1,366
Oklahoma [1]	111
Puerto Rico	332
South Carolina	784
Washington	906
Wisconsin	2,004

[1] Exclusive of Oklahoma City and Tulsa.

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr 21, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross-section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	1	------	0	0	6	2	0	0	0	14	28
New Hampshire											
Concord	------	------	------	------	------	------	------	------	------	------	------
Nashua	0	------	------	5	------	5	0	------	0	0	------
Vermont											
Barre	------	------	------	------	------	------	------	------	------	------	------
Burlington	0	------	0	1	0	3	0	0	0	23	10
Massachusetts											
Boston	4	------	0	294	35	59	0	14	1	53	228
Fall River	0	------	1	1	2	1	0	1	0	0	33
Springfield	0	------	0	6	3	6	0	1	0	25	34
Worcester	0	------	0	8	12	7	0	2	0	15	62
Rhode Island											
Pawtucket	0	------	0	0	0	2	0	0	0	0	16
Providence	0	------	0	2	0	18	0	1	0	21	53
Connecticut											
Bridgeport	0	------	0	3	2	10	0	1	0	0	26
Hartford	1	------	0	0	4	14	0	0	1	3	31
New Haven	0	------	0	0	2	1	0	0	0	7	54
New York											
Buffalo	0	------	0	83	19	12	0	7	2	26	155
New York	54	10	9	123	203	378	0	93	4	138	1, 699
Rochester	1	1	0	0	4	71	0	0	0	4	73
Syracuse	0	------	0	41	4	8	0	0	1	53	50
New Jersey											
Camden	2	------	0	52	5	8	0	2	1	0	38
Newark	0	7	0	20	7	24	0	6	0	44	92
Trenton	0	3	0	61	2	17	0	2	0	2	33
Pennsylvania											
Philadelphia	8	8	5	725	61	116	0	32	2	82	535
Pittsburgh	15	3	1	207	24	40	0	3	2	39	146
Reading	0	------	0	1	1	8	0	0	0	2	25
Scranton	0	------	------	11	------	9	0	------	0	4	------
Ohio											
Cincinnati	1	------	0	17	8	26	0	12	0	6	138
Cleveland	7	24	2	126	24	138	0	10	1	123	214
Columbus	2	2	2	3	7	58	0	3	0	28	76
Toledo	1	1	1	52	8	51	0	10	0	93	91
Indiana											
Fort Wayne	1	------	0	28	0	14	0	0	3	0	20
Indianapolis	2	------	1	320	14	24	0	4	0	61	------
South Bend	0	------	0	10	0	1	0	1	0	0	23
Terre Haute	1	------	0	0	1	1	0	1	0	0	23
Illinois											
Chicago	8	4	6	438	73	296	0	41	1	208	711
Cicero	------	------	------	------	------	------	------	------	------	------	5
Springfield	2	------	0	75	3	2	0	1	0	26	21
Michigan											
Detroit	7	2	1	123	22	152	0	18	0	159	255
Flint	0	------	0	16	9	122	0	3	0	6	35
Grand Rapids	0	------	1	3	1	35	0	0	0	1	34
Wisconsin											
Kenosha	0	------	0	1	1	13	0	0	0	2	5
Madison	0	------	0	21	2	3	0	0	0	11	19
Milwaukee	1	------	0	0	4	138	0	2	0	160	96
Racine	0	------	0	2	0	4	3	1	0	13	20
Superior	0	------	0	0	2	0	0	1	0	0	11
Minnesota:											
Duluth	0	------	0	1	1	0	0	2	0	1	15
Minneapolis	1	------	1	13	12	22	0	3	1	25	104
St. Paul	0	------	0	6	8	10	0	0	0	22	63
Iowa:											
Des Moines	1	------	------	0	------	22	0	------	0	0	29
Sioux City	0	------	------	1	------	2	0	------	0	3	------
Waterloo	0	------	------	------	------	2	0	------	0	7	------

City reports for week ended Apr. 21, 1934

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Missouri											
Kansas City	4		0	7	15	14	0	4	0	13	90
St. Joseph	2		0	19	6	0	0	1	0	0	40
St. Louis	15		0	31	12	33	0	14	2	74	204
North Dakota											
Fargo	0		0	24	0	1	0	0	0	3	5
Grand Forks	0			1		2	0		0	0	
South Dakota											
Aberdeen	0			8		0	0		0	13	
Sioux Falls	0			7		0	0		0	0	6
Nebraska											
Omaha	1		0	137	7	11	2	2	0	14	63
Kansas											
Topeka	0		0	4	1	2	0	1	0	33	36
Wichita	0		0	43	2	3	0	0	0	44	24
Delaware											
Wilmington	0		0	35	2	2	0	1	0	5	33
Maryland											
Baltimore	7	2	0	1,395	29	36	0	15	0	118	230
Cumberland	0		0	0	0	0	0	0	0	0	15
Frederick											
District of Columbia											
Washington	7	2	1	226	20	14	0	11	1	28	173
Virginia											
Lynchburg	2		0	4	0	0	0	0	1	6	10
Norfolk	1		0	81	4	1	0	1	0	2	41
Richmond	1		0	230	4	7	0	10	3	0	52
Roanoke	0		1	1	0	0	0	1	0	7	14
West Virginia											
Charleston	1	1	0	2	1	0	0	0	2	0	11
Huntington	2			0		13	0		0	0	
Wheeling	0		0	4	3	17	0	3	0	2	20
North Carolina											
Raleigh	0		0	20	2	0	0	2	0	21	15
Wilmington	0		0	2	4	0	0	0	0	0	13
Winston-Salem	0		0	6	2	2	0	3	0	1	21
South Carolina											
Charleston	0	23	0	30	2	1	0	2	0	0	22
Columbia	0		1	0	6	0	0	1	0	0	27
Greenville	0		0	1	0	0	0	0	0	0	2
Georgia											
Atlanta	1	7	2	63	13	7	0	4	0	2	96
Brunswick	0		0	29	0	0	0	0	0	0	3
Savannah	0	42	0	73	4	1	0	2	2	2	31
Florida											
Miami	1	1	0	307	1	0	0	1	1	3	32
Tampa	2	1	0	240	2	0	0	0	0	0	22
Kentucky											
Ashland	0			98		0	0		0	0	
Lexington	0		0	10	2	3	0	1	0	5	15
Louisville	7	1	0	25	13	39	0	2	0	71	80
Tennessee											
Memphis	1		2	105	15	3	0	7	1	12	87
Nashville	0		1	8	2	2	0	2	0	21	54
Alabama											
Birmingham	1		1	53	5	5	0	4	2	2	68
Mobile	0		0	8	0	0	0	2	0	0	26
Montgomery	1			64		0	0		0	1	
Arkansas											
Fort Smith	0			0		0	0		0	0	
Little Rock	0		0	13	6	1	0	3	0	0	10
Louisiana											
New Orleans	16	3	1	23	9	15	6	8	15	3	155
Shreveport	1		0		6	1	0	1	0	7	30
Oklahoma											
Oklahoma City	0	10	1	0	8	4	1	0	0	0	45
Texas											
Dallas	9	2	2	1	6	4	1	1	0	12	63
Fort Worth	1		1	1	1	9	0	5	1	6	30
Galveston	0		0	0	0	0	0	0	1	0	10
Houston	3		1	3	11	1	3	8	0	0	72
San Antonio	1		3	11	9	4	0	7	0	4	68

City reports for week ended Apr 21, 1934

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Montana											
Billings	0	------	0	0	0	0	0	0	0	2	11
Great Falls	0	------	0	14	0	0	0	0	0	0	5
Helena	0	------	0	0	0	0	0	0	0	0	0
Missoula	0	------	0	0	1	0	0	0	0	0	3
Idaho											
Boise	0	------	0	1	0	0	0	0	0	3	8
Colorado											
Denver	3	57	1	213	8	18	0	6	0	95	73
Pueblo	0	------	0	20	0	2	0	0	0	22	11
New Mexico											
Albuquerque	1	------	0	37	0	------	0	1	0	6	9
Utah											
Salt Lake City	0	------	1	87	4	8	2	2	0	67	38
Nevada											
Reno	0	------	0	6	1	0	0	0	0	0	3
Washington											
Seattle	0	------	2	4	4	14	3	3	0	86	87
Spokane	0	------	0	17	3	2	0	0	0	39	32
Tacoma	0	------	0	80	3	0	0	3	0	22	80
Oregon:											
Portland	0	------	1	13	3	17	0	2	0	23	70
Salem	0	------	------	0	------	1	0	------	0	1	------
California											
Los Angeles	20	27	2	40	14	48	0	23	2	73	246
Sacramento	0	------	0	14	1	0	0	3	1	4	22
San Francisco	2	------	0	173	3	15	0	10	0	4	135

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
New York				West Virginia			
New York	1	0	0	Wheeling	1	1	0
Pennsylvania				Georgia			
Philadelphia	1	1	0	Atlanta	1	1	0
Pittsburgh	1	0	0	Arkansas			
Illinois				Fort Smith	2	0	0
Chicago	11	5	1	Colorado			
Iowa				Denver	5	0	0
Des Moines	1	0	0	Washington			
Missouri				Seattle	1	0	0
Kansas City	1	1	0	California			
Nebraska				Los Angeles	0	0	2
Omaha	0	1	0				
District of Columbia:							
Washington	2	0	0				

Lethargic encephalitis.—Cases: Springfield, Mass., 1; New York, 1, Philadelphia, 1; Detroit, 1, St Paul, 1; Memphis, 1, New Orleans, 1

Pellagra.—Cases Charleston, S C, 3, Savannah, 1; Miami, 2, New Orleans, 1, Dallas, 3

Typhus fever.—Savannah, Ga, 1 case.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—2 weeks ended April 21, 1934.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended April 21, 1934, as follows

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Measles	308
Chicken pox	186	Poliomyelitis	1
Diphtheria	27	Puerperal septicemia	4
Dysentery	4	Scarlet fever	131
Erysipelas	11	Tuberculosis	184
German measles	13	Typhoid fever	60
Influenza	8	Whooping cough	243
Lethargic encephalitis	2		

CUBA

Habana—Communicable diseases—4 weeks ended April 21, 1934—During the 4 weeks ended April 21, 1934, certain communicable diseases were reported in Habana, Cuba, as follows

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	3	1	Scarlet fever	1	
Malaria	15	2	Tuberculosis	57	5
Measles	1		Typhoid fever	26	8

ITALY

Communicable diseases—4 weeks ended November 12, 1933—During the 4 weeks ended November 12, 1933, cases of certain communicable diseases were reported in Italy, as follows:

Disease	Oct 16-22		Oct 23-29		Oct 30-Nov 5		Nov 6-12	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	20	19	23	18	24	23	21	19
Cerebrospinal meningitis	5	5	3	3	5	5	1	1
Chicken pox	102	61	100	47	96	53	176	80
Diphtheria and croup	779	387	839	397	764	367	782	381
Dysentery	28	15	20	12	14	8	10	8
Lethargic encephalitis	3	2	1	1	2	2		
Measles	768	148	995	143	973	160	1,523	214
Poliomyelitis	22	15	12	12	11	11	9	9
Scarlet fever	364	190	526	193	441	195	505	204
Typhoid fever	719	397	914	425	664	350	790	409

JAMAICA

Communicable diseases—4 weeks ended April 21, 1934.—During the 4 weeks ended April 21, 1934, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows:

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	2	27	Puerperal fever		3
Dysentery	9	23	Tuberculosis	23	99
Erysipelas	1		Typhoid fever	32	67
Leprosy		2			

YUGOSLAVIA

Communicable diseases—March 1934.—During the month of March 1934 certain communicable diseases were reported in Yugoslavia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	28	1	Poliomyelitis	6	
Cerebrospinal meningitis	18	4	Scarlet fever	245	6
Diphtheria and croup	639	61	Sepsis	14	3
Dysentery	11		Tetanus	19	13
Erysipelas	190	8	Typhoid fever	100	13
Measles	1,199	37	Typhus fever	361	29
Paratyphoid fever	4				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Apr. 27, 1934, pp. 541–554. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued May 25, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Philippine Islands.—No cholera was reported in the Philippine Islands during the week ended April 28, 1934.

Plague

Belgian Congo—Stanleyville Province.—During the week ended April 21, 1934, 1 case of plague with 1 death was reported in Stanleyville Province, Belgian Congo.

X

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 20

MAY 18 - - - - 1934

IN THIS ISSUE

Silicosis—Review of History, Pathology, and Prevention
Report of Cases of Clonorchiasis in Natives of Hawaii
Deaths in Large Cities During the Week Ended April 28
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D C. - - - - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

	Page
Silicosis	595
Clonorchiasis in Hawaii—Report of cases in natives	602
Court decision on public health	604
Deaths during week ended April 28, 1934	
Deaths and death rates for a group of large cities in the United States	605
Death claims reported by insurance companies	605
PREVALENCE OF DISEASE	
United States:	
Current weekly State reports	
Reports for weeks ended May 5, 1934, and May 6, 1933	606
Summary of monthly reports from States	608
Plague-infected ground squirrels in Kern and Tulare Counties, California	609
Weekly reports from cities	
City reports for week ended April 28, 1934	609
Foreign and insular:	
Canada	
Provinces—Communicable diseases—2 weeks ended April 21, 1934	612
Ontario Province—Communicable diseases—5 weeks ended March 31, 1934	612
Czechoslovakia—Communicable diseases—February 1934	613
Puerto Rico—Notifiable diseases—4 weeks ended April 21, 1934	613
Spain—Vital statistics—1933	613
Cholera, plague, smallpox, typhus fever, and yellow fever:	
Cholera	614
Plague	614
Yellow fever	614

PUBLIC HEALTH REPORTS

VOL. 49 MAY 18, 1934 NO. 20

SILICOSIS *

By R. R SAYERS, *Surgeon, United States Public Health Service, Medical Officer in Charge, Office of Industrial Hygiene and Sanitation*

While clean air is obviously preferable to dirty or dusty air, the harmfulness of the dust varies with a number of factors, as the composition of the dust, size of the particles, and concentration in the air. Some dusts, as coal dust, flour, and aluminum dust, are inflammable and when in proper concentration in the air if ignited may explode. Other dusts, as arsenic, lead, and some dyes, are classed as toxic. Still others, as silica and asbestos, are not inflammable and are not usually considered as toxic, yet breathing them results in pathological changes with the accompanying impairment to the health of the individual The disease of the lungs caused by these dusts is known under the general name of "pneumoconiosis", and "silicosis" when produced by silica dust. Silicosis is also known as "miners' phthisis" and "miners' consumption."

The Committee on Pneumoconiosis of the Industrial Hygiene Section of the American Public Health Association recently defined silicosis as—

> a disease due to breathing air containing silica (SiO_2), characterized anatomically by generalized fibrotic changes and the development of miliary nodulation in both lungs, and clinically by shortness of breath, decreased chest expansion, lessened capacity for work, absence of fever, increased susceptibility to tuberculosis (some or all of which symptoms may be present), and by characteristic X-ray findings.

This definition purposely excluded diseases produced by other dust such as asbestos, talc, and coal dust. Although the definition is limiting, it is believed to be inclusive enough to cover the disease that has been recognized for a great many years as being the primary cause of extensive morbidity and mortality among workers in certain trades and districts of the world.

Collis [1] gives a very complete report on the literature from the time of Hippocrates up to the present. Hippocrates spoke of the metal digger as a man who breathed with difficulty and had other

* Presented before the New York Academy of Medicine, Dec 8, 1932

[1] Collis, Edgar L. Industrial pneumonoconioses, with special reference to dust phthisis Milroy Lectures. 1915 42 pp

symptoms similar to those found in silicosis. Agricola, in 1557, stated:

Some mines are very dry, and the constant dust enters the blood and lungs, producing the difficulty of breathing the Greeks call asthma. When the dust is corrosive, it ulcerates the lungs and produces consumption, hence it is that in the Carpathian Mountains there are women who have married seven husbands, all of whom this dreadful disease has brought to an early grave

Lohneiss, in 1690, referring to miners, describes the effects on them as follows:

The dust and stone fall upon the lungs, the men have lung disease, breathe with difficulty, and at last take consumption

In 1713 a British patent was granted for grinding flint by wet methods. Previously the flints were pounded dry, which—

Proved very destructive to mankind, so much that any person, ever so healthful and strong, working in that business cannot possibly survive over 2 years, occasioned by the dust sucked into his body by the air he breathes

In 1862 Dr. Peacock gave a report based on an examination of over 600 miners, in which he established the existence of miners' disease, distinguishing it from true phthisis, stating that—

The quickness of pulse, the rapid and extreme emaciation, and the night perspiration so characteristic of true phthisis are generally absent or only slightly marked

In 1902 a committee, of which Dr. J. S. Haldane was a member, reinvestigated the causation of the high phthisis mortality among Cornish tin miners, and decided that—

So far as the Cornish miners are concerned it seems evident enough that stone dust, which they inhale, produces permanent injury to the lung, gradually in the case of ordinary miners, and rapidly in the case of machine-drill men * * * That the primary injury to the lung is due solely to the inhalation of dust would seem to be practically certain

In 1905 the Western Australian Commission on Ventilation and Sanitation of Mines [2] made reference to miners' phthisis and in 1907 a report on miners' phthisis at Bendigo was issued by Dr. W. Summons. In 1910 [2] Dr. J. H. L. Cumpston reported on his study among miners in Western Australia. In 1909 pneumoconiosis was scheduled as an accident under the workmen's compensation act in New Zealand, but was repealed by the end of that year. In 1910 a national conference held in Chicago called attention to an interstitial pneumonia which prevailed in some of the lead and zinc mines of Missouri and in deep mines of Utah and Nevada. Although the disease was known before 1899 in the Transvaal, it was not until 1902 that a commission was appointed there to inquire into the extent that the disease prevailed. In 1911 a sanatorium was opened for the accommodation of patients, and in that same year a Miners' Phthisis Com-

[2] The Truth About Miners' Phthisis The South African Journal, vol. 25, Oct 16, 1915, p. 153.

mission was appointed, which issued a report dealing rather fully with miners' phthisis among white miners.

Silicosis is present in many of the mining districts of the United States. In 1914 Dr. A J. Lanza[3] found that 433 miners of 720 examined in the Joplin (Mo) district had silicosis. He also found in 1916 that 432 of 1,018 examined in Butte, Mont., were so affected.[4]

In 1922 Jarvis and Hoffman[5] found the mortality from this disease to be very high among granite workers in Vermont In 1929 Dr. A. E. Russell[6] and others, of the United States Public Health Service, completed a study in this same district, in which they found the universal occurrence of silicosis among the workers but an absence of deaths from silicosis *per se*, tuberculosis apparently always intervening.

An investigation was made in 1926 by Hayhurst[7] and his coworkers in one of the largest and deepest sandstone districts in the world, located in Ohio and worked for more than 50 years The workmen were employed by two quarry companies which marketed grindstones, scythestones, curbing, flagging, breakwater and building stone, and also furnace sand. The investigators state that of 260 of the men having silicosis only 13, or 6 percent, had tuberculosis, as compared with the 20 to 30 percent reported as usually found present by silicosis studies throughout the world No explanation has been found yet for this anomaly

In 1923 the mining companies of the tri-State district of Kansas, Missouri, and Oklahoma, in the interest of the health and safety of their employees, requested the Bureau of Mines to determine whether measures in use for the prevention of silicosis were adequate and, if not, to recommend improvements. This investigation included the examination of 309 miners, of whom 101 were found to be negative, 114 doubtful, and 94 positive for silicosis.

In 1924 a small clinic with a physician and a clerk on duty was organized at Picher, Okla., to conduct examinations of miners. In 1926 more men were applying for examination than the small force at the clinic could handle In 1927 the Metropolitan Life Insurance Co. and the mine operators through their association entered into an agreement with the United States Department of Commerce, through the Bureau of Mines, to supply additional funds for expanding the

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[3] Lanza, A. J Miners' consumption—A study of 433 cases of the disease among zinc miners in southwestern Missouri, with a chapter on roentgen-ray findings in miners' consumption, by Dr S. B Childs. Public Health Bull 85, U S Public Health Service 1917. 40 pp

[4] Harrington, D , and Lanza, A J. Miners' consumption in the mines of Butte, Mont Tech Paper 260, Bureau of Mines 1921 19 pp

[5] Hoffman, Frederick Bureau of Labor Statistics Bull 293 1922 178 pp

[6] Russell, A E , Britten, R H , Thompson, L. R , and Bloomfield, J. J Health of workers in dusty trades. II Exposure to siliceous dust (granite industry) Public Health Bulletin No 187, U.S. Public Health Service 1929 206 pp

[7] Hayhurst, E R , Kindel, D J , Neiswander, B E , and Barrett, C D · Silicosis with low incidence of tuberculosis Jour Ind Hyg , vol 11, no 7, September 1929, pp 228–244

work of the clinic in the Picher field. The investigation was completed on June 30, 1932, and the clinic turned over to the association for continuance. During the period covered by the Bureau's investigation, 27,553 miners and a number of women and children were examined. Five manuscripts, one for each year that the Picher clinic has been in operation, have been completed, and two summarizing the first 2 years' work published. Of 7,722 miners and men seeking mine employment who were examined the first year of clinic operation, 5,704 were classified as negative, 1,362 as having first-stage silicosis, 253 as having second stage, 32 as having third stage, 267 were diagnosed as having silicosis complicated with tuberculosis, and 104 as having tuberculosis without silicosis.

In 1929 a committee was appointed by the Industrial Commissioner of New York to draft for recommendation to the Industrial Board rules relating to the regulation of rock drilling, sand blasting, and rock crushing The same year an examination was made in New York City of 208 men exposed to rock dust in subway or tunnel construction [8] Silicosis was found to be present in 118, or 57 percent, of the men examined.

Silicosis probably occurs in the mining and allied industries throughout the world. Eight countries were represented at the international conference held in Johannesburg in 1930. A recent bibliography on pneumoconiosis [9] lists references to the literature of 26 countries. The disease occurs in the pottery, foundry, sand-blasting, abrasive, granite, tool and ax grinding, glass, slate, silica grinding, and mining industries.

Since the literature of practically all the principal nations of the world contains articles on this subject, it is apparent that no nationality is exempt, and that all races are susceptible is shown by the wide distribution of silicosis. Although the incidence is higher among the younger miners in districts where the percentage of free silica is high, and among older miners where the percentage of silica is low, age in itself probably is no great factor.

Previous occupation of the men may have a definite influence in predisposing to silicosis, if they have been exposed to dust or to other respiratory irritants. According to some investigators, animal experiments indicate that coal dust has this effect. Three groups of animals were exposed for a definite time as follows: Group 1 to free silica dust, group 2 to a mixture of coal dust and silica dust, and group 3 first to coal dust and then to silica dust. They were examined several months after exposure, and groups 1 and 2 had more silica remaining

[8] Smith, Adelaide R : Silicosis among rock drillers and excavators in New York City Jour Ind. Hyg, vol. 11, no. 3, March 1929, pp 92-96

[9] International Labour Office, Pneumoconiosis. A list of references. Studies and Reports, Series F (Industrial Hygiene), no. 15, 1932, 76 pp.

in the lungs than group 3, although silica dust could be demonstrated in all groups.[10]

Men who have or have had respiratory diseases, especially tuberculosis, are apparently more readily affected by silica dust.

Silicosis has been divided arbitrarily into various stages In South Africa the stages are defined by law as anteprimary, primary, and secondary. This same classification is followed also in Ontario. In the United States the stages are called first, second, and third The Committee on Pneumoconiosis, referred to above, describes the stages as follows

First stage (corresponds to anteprimary stage of South Africa) — The symptoms of uncomplicated first-stage silicosis are few and often indefinite The man may apparently be quite well and his working capacity not noticeably impaired Slight shortness of breath on exertion and some unproductive cough, often with recurrent colds, are the most usual symptoms The man may have a little less ability to expand his chest than formerly and the elasticity of the chest may be slightly impaired The earliest specific indication of the presence of silicosis is the radiographic appearance, consisting of generalized arborization throughout both lung fields with more or less small, discrete mottling.

This characteristic mottling is due to shadows cast by the discrete individual nodules of fibrous tissue in the lungs and is essential to the diagnosis of silicosis Without this finding the diagnosis of silicosis is not sustained except by autopsy.

Second stage (corresponds to primary stage of South Africa).—A definite shortness of breath on exertion is usually found, and pains in the chest are a frequent complaint. A dry morning cough is often present, sometimes with vomiting, and recurrent colds are more frequent. Even then the man's appearance may be healthy, but he is dyspnoeic on exertion, he cannot work as well as formerly, his chest expansion is noticeably decreased, the movement being sluggish and diminished in elasticity.

The characteristic radiographic appearance is a generalized, medium-sized mottling throughout both lung fields The shadows of the individual nodules are for the most part discrete and well defined on a background of fibrous arborization, but there may be here and there larger but limited opacities due to irregular pleural thickening or to a localized aggregation of nodules.

Third stage (corresponds to the secondary stage of South Africa).—In the third stage the shortness of breath is marked and distressing even on slight exertion. The cough is more frequent; the expectoration is in most cases slight, but may be copious. The individual's

[10] Mavrogordato, A Studies in experimental silicosis and other pneumonokonioses Publication of the South African Institution for Medical Research Johannesburg, Mar 31, 1922 164 pp

capacity for work becomes seriously and permanently impaired; his expansion is greatly decreased even with forced inspiration; he may lose flesh; his pulse rate may be increased, and his heart may become dilated.

The radiographic appearances in the third stage are further accentuated, the mottling is more intense, the nodules are larger and take on a conglomerate form so that large shadows are shown corresponding to areas of dense fibrosis

Physical examination of an individual may reveal changes in percussion and auscultation, mild in the first stage and increasing with the progress of the disease. These alone are not sufficient to be of great value in diagnosis of silicosis

The pathology of silicosis is well summarized in the statement on The Medical Aspects of Silicosis made at the International Conference on Silicosis held in Johannesburg August 13 to 27, 1930 [11] It was agreed that the microscopic pathological changes that may be produced by the prolonged inhalation of silica dust are as follows:

(*a*) The development of a condition designated in South Africa as a dry bronchiolitis, characterized by an accumulation of dust-filled phagocytes in or in relation to the terminal bronchioles, with possibly some desquamation of their epithelium.

(*b*) The accumulation of dust-containing phagocytes about and in the intrapulmonary lymphoid tissue, and their transportation through the lymphatics into the tracheobronchial lymph nodes (The conditions described above under (*a*) and (*b*) do not constitute the disease silicosis.)

(*c*) The gradual development of fibrous tissue within such accumulations of phagocytes and the formation of characteristic nodules of hyaline fibrous tissue.

(*d*) Degenerative changes in these foci.

(*e*) The hyaline nodules increase in size by extension at their periphery Coalescence of adjacent nodules takes place and brings about involvement of further areas of the lung. (The conditions described under (*c*), (*d*), and (*e*) constitute the disease silicosis)

Dr. Watkins-Pitchford [12] calls to attention that due to the effect of the silica that remains in the lungs the disease may progress for some time after the individual is no longer exposed to breathing the siliceous dust. However, a man suffering from simple silicosis generally improves when removed from the dusty atmosphere and placed in suitable surroundings.

If breathing a dust causes a disease, evidently the disease would not result if the dust were not in the air breathed. In order to control the dustiness of the air, the amount of dust present must be determined. Two factors are usually considered, namely, the weight and the number of particles of dust in a given quantity of air. Many instruments have been devised for making these determinations, but any

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[11] Silicosis Records of the International Conference held at Johannesburg, Aug 13–27, 1930 Studies and reports of International Labour Office, Series F (Industrial Hygiene) no 13, Geneva, 1930, p. 87.

[12] Watkins-Pitchford, W Address before meeting of Pan Pacific Science Congress, Melbourne, Australia, Aug. 13, 1923, abstract in Med. Jour Australia, vol 2, Sept 29, 1923, pp 325–327

apparatus to be of value must be able to remove a large percentage of the dust from the sample of air and retain it in a form that may be examined The sugar-tube method and the konimeter were used in South Africa and later in other parts of the world, including the United States More recently the impinger, developed by Leonard Greenburg, of the United States Public Health Service, and G. W. Smith, of the United States Bureau of Mines, has been the method of choice in the United States Among some of the other instruments are the Read water-spray dust collector, the Kotze hydrokonimeter of South Africa, the Owen dust counter, and the electric dust collector of Philip Drinker.

The instruments mentioned will give information as to the condition of the air but will not aid in any way in protecting the men breathing it. The men will be protected (1) if no dust is formed, (2) if, when formed, the dust is prevented from getting into the air, (3) if once in the air the dust is removed from the air, and (4) if the dusty air is replaced by clean air.

In the mining industry, wet methods have been used to prevent the dust from getting into the air to be breathed, as wet drilling, wetting the working face and the rock or ore before shoveling. This method has materially reduced the number of cases of silicosis produced.

In the tool- and ax-grinding industry, wet methods were found to be less efficacious than dry exhaust. Recently exhaust systems have been developed for use in drilling for foundations in New York City which promise to be useful in more extended fields Where wet methods are used, they have not been found sufficient to keep the air entirely free from dust.

General ventilation is as important, if not more important, a preventive measure. If the dusty air can be replaced by clean air, or the dusty air sufficiently diluted by clean air, the opportunity for the development of silicosis can be greatly reduced.

The Bureau of Mines has advised that for exposure to silica (quartz) dust the count should not exceed 10,000,000 particles per cubic foot when collected by the Greenburg impinger method and counted with about 110 diameters magnification, light field illumination. This is practically equivalent to 300 particles per cubic centimeter. The United States Public Health Service finds [13] that a safe limit lies somewhere between 9,000,000 and 20,000,000 particles per cubic foot of air. The dust referred to is granite dust with about 25 to 35 percent of free silica and 60 to 70 percent of total silica. Oklahoma has included a limit of 300 particles per cubic centimeter in its law, and 10,000,000 particles per cubic foot has been included in the regulations of the Department of Labor of New York State. A

[13] See footnote 6

similar standard is being used in Wisconsin and in Ontario, and is in agreement with the standard fixed some years ago in South Africa.

Respiratory diseases probably predispose to silicosis Individuals with tuberculosis are a menace to others working in silica dust, as the silicotic individual is very much more susceptible to tuberculosis than is the normal man. Physical examination before employment and of all workers at regular intervals has been required by law in Australia, South Africa, Great Britain, and Ontario, Canada. Any man suffering with silicosis should not be employed where he will have to breathe dust, especially silica dust If he has tuberculosis, he should not be permitted to work where he will be in contact with those exposed to silica dust.

In some countries the physical examinations are made by a national medical bureau constituted for the purpose. In other countries the men best qualified in various districts are appointed by the Government to make the examinations In still others, a board consists of a medical man appointed by the State, one selected by the industry, and a third by the employees The men selected to make these physical examinations should be experienced in respiratory diseases, especially those caused by dust, should be acquainted with the industry and the conditions under which the men must work, and should be neutral, that is, should favor neither the employer nor the employee. However experienced and fair-minded they may be, occasionally either the employer or the worker wants an appeal, which can usually be made only to the board itself. The examination of the man in question is made by another member of the board without the examiner being acquainted with the fact that an appeal has been made. The findings of the two physicians are then reviewed by conference of the entire board.

Physical examination is believed to be very important for prevention of silicosis, as well as tuberculosis; but it must be remembered that no one measure is successful. A combination of all preventive measures—methods of control of dust at its source, good ventilation for dilution, and initial and periodical physical examination—are needed to prevent silicosis.

CLONORCHIASIS IN HAWAII

Report of Cases in Natives of Hawaii

By Chapman H. Binford, *Passed Assistant Surgeon, United States Public Health Service, Leprosy Investigation Station, Honolulu, Hawaii*

During the past year the ova of *Clonorchis* were found in the stools of four native-born Hawaiians who have resided continuously in the Territory of Hawaii. These findings were obtained in the course of

single routine examinations of the stools of 123 leprous patients who have been recently admitted to segregation

The following is the report of cases in which the ova of *Clonorchis sinensis* were found

S P, male, age 39, Hawaiian, born on the Island of Maui and has lived on Maui with the exceptions of periods 1914–18 and 1929–33, during which he lived on the Island of Molokai Positive findings were obtained in four stool specimens collected at intervals of several days

G K, male, age 48, Hawaiian, born on the Island of Maui and has resided there continuously except for short visits to other islands Positive findings were obtained in 3 stool specimens collected at intervals of from 7 to 10 days

A P, female, age 14, Korean, born on the Island of Maui and has always lived there Two stool examinations made on specimens collected at intervals of 1 day were positive for the ova

C. K., female, age 16, part Hawaiian, born on the Island of Oahu and has lived there with the exception of a short visit to the Island of Maui at some date during the past 3 years The ova were found in 2 stool specimens examined at 2-day intervals

In the above case reports it is not to be implied that some stool specimens may have been negative for the ova In each case all stool specimens examined have been positive.

It is of interest to note that each of the above four patients had lived on the Island of Maui for various periods

The significance of these findings is apparent when it is realized that previous to the year 1927 aliens who were affected with *Clonorchis* were mandatorily excluded under Federal immigration regulations, which classified the condition as a loathsome and contagious disease. In 1927 the regulations were modified, because the investigations and surveys made by the United States Public Health Service indicated that the disease had not spread to man within the boundaries of the United States and the Territory of Hawaii. It was felt that an undue hardship was being worked on arriving aliens infested with *Clonorchis sinensis*.

The infestation of man and mammals is usually brought about by the consumption of raw fish, or fish that is dried, salted, refrigerated, or inadequately cooked. This may have taken place in the abovementioned cases, either through the importations of infested fish or through the infestation of native fish

Large quantities of fish are imported to Hawaii from China and Japan, according to statistics obtained from the local office of the United States Customs. During 1932 there were imported from Japan 49,647 pounds of frozen fresh fish and 1,730,120 pounds of fish preserved by drying, pickling, or salting Of a similarly preserved group, 114,878 pounds were imported from China. There were also imported from Japan 1,280 pounds of frozen fish, classified as "Fresh water fish and eels" Information regarding the localities in which the imported fish were caught or their species was not available.

Under natural conditions the parasite goes through a cycle of development which involves both a snail host and a fish host, together with intermediary phases in which it is a free swimming parasite The studies of Faust, Walker, and Barlow[1] indicate that the snail hosts of Japan, China, and Southeastern Asia are various species of the family Amnicolidae and the subfamily Bithyniinae. These are operculated snails. Some evidence has been reported to indicate that one species of the Melaniidae, namely, the *M. hongkongiensis* Brot, may also be a host. Montague Cooke, malacologist of the Bishop Museum, Honolulu, states that the operculated snails which have been found in Hawaii are 1 imported species of Viviparidae and 3 native species of Melaniidae.

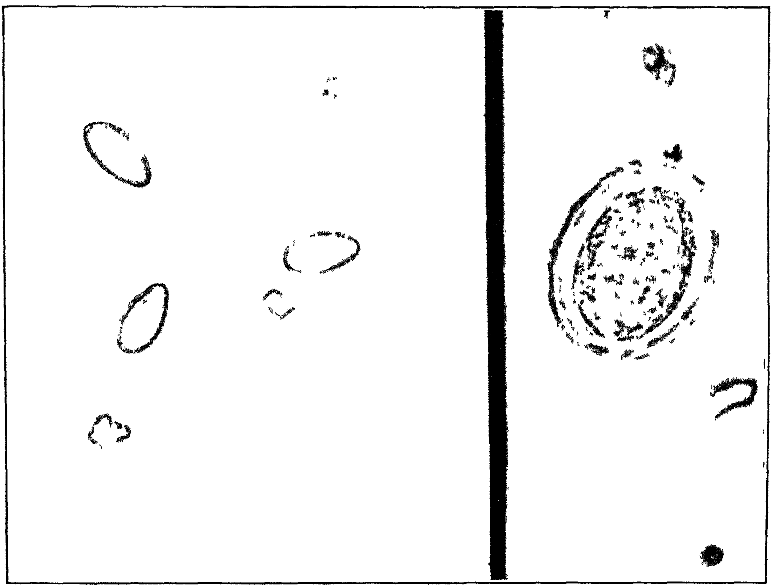
The investigations of the above-mentioned authors have shown that the principal species of Oriental fish in which the *Clonorchis sinensis* encysts are those belonging to the groups Cyprinidae (carp), Gobiidae (goby), and Anabantidae (paradise fish). Live specimens of the Cyprinidae and Anabantidae have been imported to Hawaii for ornamental purposes, and several species of the Gobiidae are native in the Territory. The topography of the islands is such that there are no large natural streams or bodies of fresh water favorable to the growth of fish However, a few are caught in the small mountain streams and in the artificial ponds where taro is grown for the production of poi, the principle article in the native Hawaiian diet. Two of the patients, S P. and G. K., give a history of having eaten raw "gold" fish (probably Cyprinidae) which were caught in taro ponds.

These observations have been made under the direction of and in consultation with Surg. N E. Wayson, United States Public Health Service, who has previously studied the subject. The findings have been further confirmed by the division of zoology at the National Institute of Health, Washington, D C.

COURT DECISION ON PUBLIC HEALTH

Liability of city for nuisance created in disposing of garbage and refuse.—(Texas Court of Civil Appeals; *City of Longview* v. *Stewart*, 66 S.W. (2d) 450; decided Dec. 8, 1933) An action was brought against the city of Longview to recover damages for injury to real property alleged to have been sustained because of the maintenance by the city of a dumping ground for garbage, refuse, and the like. A jury found that the dumping ground constituted a nuisance to plaintiff's property, which nuisance had depreciated the rental value of the property in a certain amount. The trial court entered judgment in favor of the plaintiff.

[1] Faust, E C., et al.. Am J Hyg , Monographic Series, No. 8 (March 1927).



Ova of *Clonorchis sinensis* from stool of S P , showing comparison in size with ovum of *Ascaris lumbricoides* Approximately × 550

On appeal, one of the contentions made by the city was that a municipality, operating and maintaining a dumping ground for the benefit of its citizens without profit or gain being derived therefrom, did so in its governmental capacity and, therefore, was not liable for the negligence of its employees The holding of the court of civil appeals, however, was adverse to this contention, the court saying that it appeared to be well settled in Texas that a city, in disposing of its garbage and refuse, acts in its corporate and not in its governmental capacity and that, if a nuisance is created and maintained thereby, it is liable to injured adjacent property owners without respect to whether in so doing it was negligent or not.

DEATHS DURING WEEK ENDED APR. 28, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended Apr 28, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	8,613	8,093
Deaths per 1,000 population, annual basis	12 0	11 3
Deaths under 1 year of age	643	654
Deaths under 1 year of age per 1,000 estimated live births	60	[1] 56
Deaths per 1,000 population, annual basis, first 17 weeks of year	12 6	12 0
Data from industrial insurance companies		
Policies in force	67,729,876	68,497,693
Number of death claims	13,953	13,191
Death claims per 1,000 policies in force, annual rate	10 7	10 0
Death claims per 1,000 policies, first 17 weeks of year, annual rate	11 1	10 9

[1] Data for 81 cities

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended May 5, 1934, and May 6, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 5, 1934, and May 6, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6, 1933
New England States								
Maine	1	2		28	31	6	0	1
New Hampshire					157	6	0	0
Vermont					62	32	0	0
Massachusetts	12	15		2	1,425	460	1	3
Rhode Island					17	2	0	1
Connecticut	3	1	1	4	126	274	0	0
Middle Atlantic States								
New York	48	63	[1] 12	[1] 26	1,220	2,829	5	2
New Jersey	15	21	18	4	781	952	2	0
Pennsylvania	58	48			3,306	1,403	5	2
East North Central States								
Ohio	26	30	6	9	1,559	652	7	0
Indiana	13	13	14	33	1,307	316	1	0
Illinois	31	26	51	23	2,418	842	13	10
Michigan	15	12	3	2	281	915	0	6
Wisconsin	2	5	33	43	2,030	416	1	0
West North Central States								
Minnesota	8	2	2	1	302	903	1	1
Iowa [2]	6	11	2		186	63	0	1
Missouri [2]	35	20	49	1	608	184	0	3
North Dakota	5		2		165	88	0	3
South Dakota	3	2			425	37	0	0
Nebraska	11	2			369	117	2	0
Kansas	11	7	2	4	635	407	4	0
South Atlantic States:								
Delaware	4	1			108	4	0	0
Maryland [3]	2	7	4	7	2,597	32	0	1
District of Columbia	3	4	2		97	16	0	0
Virginia	7	9			1,139	214	6	3
West Virginia	20	5		7	97	84	0	1
North Carolina	12	19	25	13	2,174	696	2	0
South Carolina	8	14	324	247	443	499	0	0
Georgia [3]	6	5			252	106	0	0
Florida [3]	4	3		2	911	94	1	0
East South Central States:								
Kentucky	11	5	8	22	509	114	2	0
Tennessee	9	11	47	50	526	110	3	2
Alabama [3]	5	6	66	34	703	114	3	0
Mississippi [3]	8	6					1	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 5, 1934, and May 6, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6 1933
West South Central States								
Arkansas	9	8	9	11	38	200	2	0
Louisiana	22	8	5	7	196	33	0	1
Oklahoma [4]	3	4	42	25	310	166	6	4
Texas [3]	52	49	228	91	852	1,388	3	2
Mountain States								
Montana [5]	5		40	8	108	38	0	1
Idaho [5]	1			3	33	31	0	0
Wyoming [5]					130	8	0	1
Colorado	9	1		27	691	3	0	0
New Mexico	4	6	1	20	180	8	0	0
Arizona		2	4		76	92	0	0
Utah	1				166	6	0	0
Pacific States								
Washington	2	4		38	240	96	0	1
Oregon [5]	3	2	19	24	79	75	0	1
California [5]	44	26	49	20	930	1,329	1	1
Total	557	485	1,068	836	31,055	16,460	72	52

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6, 1933
New England States								
Maine	0	0	11	17	0	0	0	2
New Hampshire	0	0	8	17	0	0	0	1
Vermont	0	0	2	10	0	0	17	0
Massachusetts	1	1	217	377	0	0	1	0
Rhode Island	0	0	20	33	0	0	1	0
Connecticut	0	0	60	106	0	0	1	3
Middle Atlantic States								
New York	4	2	768	758	0	2	7	12
New Jersey	0	0	177	276	0	0	3	4
Pennsylvania	0	5	642	875	0	0	9	7
East North Central States.								
Ohio	0	2	820	557	1	0	6	7
Indiana	0	3	159	136	5	1	7	5
Illinois	1	0	575	369	4	7	4	11
Michigan	1	3	672	420	1	0	8	4
Wisconsin	0	0	187	145	28	0	3	1
West North Central States								
Minnesota	0	0	57	101	12	0	0	1
Iowa [2]	0	0	75	28	11	19	0	0
Missouri [2]	0	0	87	84	4	0	8	1
North Dakota	0	0	21	18	0	0	0	1
South Dakota	1	0	13	18	3	0	1	0
Nebraska	0	0	35	14	9	1	0	0
Kansas	0	1	43	25	5	1	3	2
South Atlantic States								
Delaware	0	0	4	14	0	0	1	0
Maryland [2]	1	0	52	123	0	0	9	1
District of Columbia	0	0	10	14	0	0	0	0
Virginia	0	2	34	34	0	0	7	10
West Virginia	0	0	77	21	1	2	5	6
North Carolina	1	1	19	56	3	7	2	4
South Carolina	0	0	5	3	0	0	3	6
Georgia [3]	1	0	2	4	0	0	4	9
Florida [3]	0	0	3	3	0	0	3	1
East South Central States								
Kentucky	0	0	57	68	0	0	8	8
Tennessee	0	1	29	40	0	2	7	4
Alabama [3]	0	0	8	10	0	0	6	1
Mississippi [2]	1	0	7	9	0	2	1	[illegible]

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 5, 1934, and May 6, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6, 1933	Week ended May 5, 1934	Week ended May 6, 1933
West South Central States								
Arkansas	1	0	7	3	1	6	7	2
Louisiana	0	0	11	10	0	0	18	8
Oklahoma [4]	0	0	15	7	3	1	3	1
Texas [3]	2	2	62	57	27	17	18	12
Mountain States								
Montana [5]	0	0	10	10	2	2	1	1
Idaho [5]	3	0	3	6	0	6	2	0
Wyoming [5]	0	0	11	9	1	0	0	3
Colorado	0	0	27	33	5	3	0	0
New Mexico	0	0	12	10	0	1	4	2
Arizona	2	0	10	7	0	1	0	0
Utah	0	0	10	6	0	0	1	0
Pacific States								
Washington	0	1	49	55	8	5	5	0
Oregon [5]	1	1	42	24	2	10	2	1
California [5]	13	1	201	141	11	32	5	6
Total	34	26	5,426	5,161	147	128	201	156

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended May 5, 1934, 10 cases, as follows Georgia, 4, Florida, 2, Alabama, 2, Texas, 2
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended May 5, 1934, 31 cases, as follows Montana, 6, Idaho, 1, Wyoming, 15, Oregon, 6, California, 3

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April 1934										
Arkansas	7	24	56	88	579	33	0	21	7	3
Connecticut	5	10	9		206		0	295	0	4
District of Columbia	2	43	4		1,123	1	1	49	0	3
Maine	1	5	4		83		0	62	0	37
Nebraska	4	12	13		1,151		2	159	37	0
Vermont		1			379		0	37	0	[1] 37

[1] Water-borne epidemic caused by broken sewer.

April 1934	Cases
Actinomycosis:	
Connecticut	1
Chicken pox	
Arkansas	62
Connecticut	383
District of Columbia	106
Maine	173
Nebraska	296
Vermont	153
Dysentery	
Arkansas	3
Connecticut (bacillary)	1
German measles	
Connecticut	7
Maine	90
Lethargic encephalitis:	
Connecticut	2
District of Columbia	1

April 1934—Contd	Cases
Mumps	
Arkansas	52
Connecticut	532
Maine	22
Nebraska	74
Vermont	56
Ophthalmia neonatorum	
Connecticut	1
Rabies in animals	
Connecticut	4
Maine	1
Septic sore throat	
Connecticut	4
Tetanus	
Connecticut	1
Trachoma	
Arkansas	2

April 1934—Contd.	Cases
Tularaemia	
Arkansas	2
Undulant fever	
Connecticut	5
Vincent's infection	
Maine	2
Whooping cough:	
Arkansas	50
Connecticut	290
District of Columbia	129
Maine	341
Nebraska	222
Vermont	144

PLAGUE-INFECTED GROUND SQUIRRELS IN KERN AND TULARE COUNTIES, CALIF.

The director of public health of the State of California has reported that from April 20 to April 30, 1934, 8 lots of ground squirrels, including 16 animals, from Kern and Tulare Counties in the interior of California, were found to be plague infected.

WEEKLY REPORTS FROM CITIES

City reports for week ended Apr. 28, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and City	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	1	5	0	0	0	0	3	33
New Hampshire											
Concord	0	------	0	5	0	3	0	0	0	0	14
Nashua	0	------	------	9	------	0	0	------	0	6	------
Vermont											
Barre	0	------	0	0	1	0	0	0	0	0	1
Burlington	0	------	0	0	0	1	0	0	0	4	8
Massachusetts											
Boston	1	------	0	308	35	57	0	9	0	63	250
Fall River	1	------	0	0	0	3	0	8	1	10	40
Springfield	0	------	0	8	0	5	0	0	0	21	36
Worcester	1	------	0	3	9	6	0	2	0	12	69
Rhode Island											
Pawtucket	0	------	0	2	0	1	0	0	0	1	18
Providence	0	------	0	4	6	19	0	1	0	12	67
Connecticut											
Bridgeport	1	------	0	1	1	7	0	3	0	0	31
Hartford	1	------	2	0	4	22	0	0	1	1	31
New Haven	0	1	1	1	4	3	0	1	0	5	42
New York											
Buffalo	8	------	0	92	33	10	0	7	0	13	141
New York	39	10	7	221	180	365	0	110	8	104	1,625
Rochester	4	------	0	1	5	49	0	1	0	5	82
Syracuse	0	------	0	35	5	3	0	1	0	64	49
New Jersey											
Camden	0	1	1	48	1	8	0	0	0	2	31
Newark	0	4	0	18	3	34	0	4	0	40	77
Trenton	0	3	0	61	6	15	0	3	0	2	33
Pennsylvania											
Philadelphia	11	2	0	471	63	123	0	36	1	71	560
Pittsburgh	12	7	3	239	28	37	0	10	0	22	164
Reading	2	------	0	4	0	10	0	2	0	6	14
Scranton	0	------	------	3	------	5	0	------	0	5	------
Ohio											
Cincinnati	4	------	1	11	16	40	0	10	0	11	158
Cleveland	4	30	1	114	27	116	0	20	0	111	236
Columbus	2	2	2	1	5	55	0	2	0	20	67
Toledo	0	------	0	57	10	28	0	5	0	131	73
Indiana											
Fort Wayne	7	------	1	36	0	18	0	0	0	0	34
Indianapolis	0	------	0	225	15	19	0	3	0	58	------
South Bend	0	------	0	4	0	6	0	1	0	0	20
Terre Haute	0	------	0	0	4	0	0	2	0	0	28
Illinois											
Chicago	3	1	8	511	78	275	0	50	0	137	756
Cicero	------	------	------	------	------	------	------	------	------	------	10
Springfield	2	------	0	52	5	1	0	0	0	14	27
Michigan:											
Detroit	4	3	3	96	23	154	0	19	0	152	263
Flint	0	------	0	25	8	122	0	1	0	17	31
Grand Rapids	0	------	0	4	0	30	0	1	0	4	31
Wisconsin											
Kenosha	0	------	------	0	------	7	0	------	0	10	10
Milwaukee	2	------	0	31	7	90	0	3	0	69	93
Racine	0	------	0	3	1	4	0	0	0	4	8
Superior	0	------	0	1	2	0	0	1	0	0	11

City reports for week ended Apr 28, 1934—Continued

State and City	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Minnesota											
Duluth	0	------	0	0	2	2	0	1	1	0	16
Minneapolis	3	------	0	12	7	16	0	5	0	23	102
St Paul	2	1	1	1	7	6	0	7	0	47	65
Iowa											
Des Moines	0	------	------	4	------	8	0	------	0	0	28
Sioux City	1	------	------	10	------	2	0	------	0	1	------
Waterloo	0	------	------	------	------	1	0	------	0	4	------
Missouri											
Kansas City	3	------	0	5	12	12	0	1	0	25	114
St Joseph	0	------	0	8	8	1	0	1	0	0	41
St Louis	19	------	1	31	16	34	0	10	0	60	304
North Dakota											
Fargo	0	------	0	13	0	0	0	0	0	10	4
Grand Forks	0	------	------	0	------	0	0	------	0	1	------
South Dakota											
Aberdeen	0	------	------	125	------	0	0	------	0	16	------
Sioux Falls	1	------	------	2	------	0	0	------	0	0	7
Nebraska											
Omaha	1	------	0	162	6	16	2	3	0	15	44
Kansas											
Topeka	0	------	0	6	7	1	0	0	0	23	3[illegible]
Wichita	0	------	0	60	2	3	0	1	0	41	23
Delaware											
Wilmington	0	------	0	51	5	2	0	0	0	4	32
Maryland											
Baltimore	1	1	3	1,673	30	33	0	11	1	159	204
Cumberland	0	------	0	7	1	1	0	1	0	0	8
Frederick	------	------	------	------	------	------	------	------	------	------	------
District of Columbia											
Washington	9	------	1	171	16	11	0	12	0	29	175
Virginia											
Lynchburg	1	------	0	18	2	0	0	1	1	9	14
Norfolk	0	------	0	48	6	1	0	3	0	1	50
Richmond	1	------	1	222	3	5	0	1	0	0	53
Roanoke	0	------	1	6	4	0	0	1	0	4	26
West Virginia											
Charleston	0	------	0	7	2	1	0	1	0	1	17
Huntington	0	------	------	0	------	9	0	------	0	0	------
Wheeling	1	------	1	3	1	22	0	1	0	4	17
North Carolina											
Raleigh	------	------	------	------	------	------	------	------	------	------	------
Wilmington	0	------	0	2	4	0	0	0	0	1	12
Winston-Salem	1	------	0	4	1	1	0	1	0	0	16
South Carolina											
Charleston	0	15	0	29	3	1	0	1	1	0	25
Columbia	0	------	2	0	4	0	0	0	0	0	29
Greenville	0	------	0	1	2	0	0	0	0	3	13
Georgia											
Atlanta	1	2	1	35	4	2	0	6	0	2	74
Brunswick	0	------	0	9	0	0	0	0	0	0	7
Savannah	1	18	0	53	1	0	0	2	0	7	37
Florida											
Miami	1	------	0	255	2	0	0	1	0	8	25
Tampa	2	------	0	207	0	0	0	1	0	0	28
Kentucky											
Ashland	1	------	------	30	------	1	0	------	0	0	------
Lexington	0	------	0	26	2	4	0	2	0	6	18
Louisville	3	------	0	35	9	25	0	1	1	60	81
Tennessee											
Memphis	1	------	1	61	13	3	0	5	0	11	86
Nashville	0	------	1	5	7	0	0	1	1	8	57
Alabama											
Birmingham	2	1	0	51	5	1	0	1	2	1	69
Mobile	0	1	1	2	2	1	0	0	0	0	20
Montgomery	0	------	------	67	------	0	0	------	0	3	------
Arkansas											
Fort Smith	0	------	------	0	------	4	0	------	0	1	------
Little Rock	1	------	0	8	6	2	0	2	0	1	9
Louisiana											
New Orleans	14	1	2	43	6	13	4	7	8	3	133
Shreveport	1	------	0	10	6	0	0	0	0	4	------

City reports for week ended Apr 28, 1934—Continued

State and City	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Texas											
Dallas	4	1	1	------	7	4	1	1	0	16	57
Forth Worth	1	------	0	3	3	2	0	1	1	11	34
Galveston	0	------	0	0	3	0	0	0	0	0	10
Houston	2	------	2	3	9	4	2	6	0	11	73
San Antonio	3	------	2	0	5	2	0	4	0	2	67
Montana											
Billings	0	------	0	0	0	0	0	0	0	6	9
Great Falls	0	------	0	14	0	0	0	0	0	0	5
Helena	0	------	0	0	0	2	0	0	0	0	3
Missoula	0	------	0	0	2	1	0	1	0	0	10
Idaho											
Boise	0	------	0	7	1	0	1	0	0	0	7
Colorado											
Denver	7	31	2	257	4	12	0	4	0	84	64
Pueblo	0	------	0	26	1	3	0	2	0	23	10
Utah											
Salt Lake City	0	------	0	51	5	4	0	3	0	84	36
Nevada											
Reno	0	------	0	2	0	1	0	0	0	0	4
Washington											
Seattle	1	------	0	6	2	25	5	7	1	62	77
Spokane	0	------	0	8	3	3	0	0	0	25	24
Tacoma	0	------	0	57	1	0	0	1	0	19	35
Oregon											
Portland	0	------	0	14	1	20	1	2	0	10	74
Salem	0	------	------	1	------	1	0	------	0	1	------
California											
Los Angeles	21	19	0	72	7	52	0	13	0	60	278
Sacramento	2	------	0	7	1	6	0	1	0	2	24
San Francisco	1	------	1	222	9	14	0	4	0	10	146

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases	State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
Massachusetts				Minnesota			
Boston	1	0	0	St Paul	1	1	0
Springfield	1	0	0	Iowa			
New York				Sioux City	1	1	0
New York	1	3	0	Missouri			
Pennsylvania				St Joseph	1	1	0
Philadelphia	1	0	0	St Louis	2	1	0
Ohio				Nebraska			
Cincinnati	4	4	0	Omaha	0	1	0
Indiana				Colorado			
Indianapolis	1	0	0	Denver	3	0	0
Illinois				California			
Chicago	6	3	0	Los Angeles	0	0	1
				San Francisco	1	1	0

Lethargic encephalitis —Cases Flint, 1; St. Joseph, 2, Baltimore, 1
Pellagra —Cases. Winston-Salem, 1, Savannah, 1, Birmingham, 1; Montgomery, 2.
Typhus fever —New York, 1 death; Houston, 1 case

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended April 21, 1934.—During the 2 weeks ended April 21, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, for 8 Provinces, as follows.

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	British Columbia	Total
Cerebrospinal meningitis	1	1		1	5			1	9
Chicken pox		9		186	457	38	62	98	850
Diphtheria		4	2	27	20	8	21		82
Dysentery				4	2			1	7
Erysipelas				11	13	3	4	3	34
Influenza		19		8	34			22	83
Lethargic encephalitis			1	2					3
Measles	1	28		321	160	1,251	42	19	1,822
Mumps					552	19	10	114	695
Paratyphoid fever					1	1			2
Pneumonia		17			54		17	13	101
Poliomyelitis		1		1					2
Scarlet fever		21	3	131	346	28	12	198	739
Smallpox								1	1
Trachoma							11		11
Tuberculosis	5	3	12	184	92	22	22	44	384
Typhoid fever				60	15	8	4	1	88
Undulant fever		1			2			1	4
Whooping cough		13	1	243	583	41	14	43	938

NOTE —No report was received from Alberta for the above period

Ontario Province—Communicable diseases—5 weeks ended March 31, 1934.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 5 weeks ended March 31, 1934, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	6	1	Paratyphoid fever	8	
Chicken pox	1,083	1	Pneumonia		209
Conjunctivitis	1		Puerperal septicemia	2	1
Diphtheria	45	2	Scarlet fever	916	6
Erysipelas	30	2	Septic sore throat	6	
German measles	24		Syphilis	204	2
Gonorrhea	177		Trench mouth	2	
Influenza	54	6	Tuberculosis	229	57
Lethargic encephalitis		1	Typhoid fever	19	1
Malaria	1		Undulant fever	10	
Measles	199		Whooping cough	912	1
Mumps	1,110				

CZECHOSLOVAKIA

Communicable diseases—February 1934.—During the month of February 1934, certain communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	5		Paratyphoid fever	4	2
Cerebrospinal meningitis	15	6	Poliomyelitis	6	1
Chicken pox	191	1	Puerperal fever	66	22
Diphtheria	1,940	123	Scarlet fever	1,759	29
Dysentery	2		Trachoma	99	
Influenza	176	11	Typhoid fever	354	34
Malaria	3		Typhus fever	17	

PUERTO RICO

Notifiable diseases—4 weeks ended April 21, 1934.—During the 4 weeks ended April 21, 1934, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico, as follows.

Diseases	Cases	Diseases	Cases
Anthrax	1	Pellagra	11
Chicken pox	146	Puerperal septicemia	4
Diphtheria	54	Ringworm	5
Dysentery	34	Syphilis	16
Erysipelas	6	Tetanus	8
Filariasis	3	Tetanus, infantile	3
Influenza	27	Trachoma	58
Malaria	[1] 5,284	Tuberculosis	525
Measles	62	Typhoid fever	30
Mumps	31	Whooping cough	237
Ophthalmia neonatorum	3		

[1] Includes results from a special survey.

SPAIN

Vital statistics—1933.—The following table shows the birth and death rates in Spain during the year 1933

Birth rate per 1,000 population	27.81
Death rate per 1,000 population	16.44
Deaths under 1 year per 1,000 live births	112
Stillbirths per 1,000 births	32.30
Death rates per 100,000 population for:	
Typhoid fever and paratyphoid fever	13.58
Typhus fever	.04
Smallpox	.01
Measles	12.49
Scarlet fever	1.45
Whooping cough	6.23
Diphtheria	4.92
Influenza	32.70
Plague	.01
Tuberculosis (respiratory system)	93.62
Tuberculosis (other forms)	24.11
Syphilis	2.43
Death rates per 100,000 population for—Contd.	
Malaria	1.17
Cancer and other malignant tumors	68.74
Diabetes mellitus	9.76
Cerebral hemorrhage, embolism, and cerebral thrombosis	133.13
Heart disease	203.30
Bronchitis	78.23
Pneumonia	164.11
Diarrhea and enteritis	184.49
Appendicitis	3.33
Nephritis	54.96
Suicide	3.89
Homicide	1.56
Violent deaths (except suicide and homicide)	30.30
Puerperal septicemia per 1,000 births	2.08

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for Apr 27, 1934, pp 541–554 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued May 25, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands —No cholera was reported in the Philippine Islands during the week ended May 5, 1934

Plague

United States—California —For the period April 20–30, 1934, inclusive, 5 lots with a total of 11 plague-infected ground squirrels were reported in Kern County, and 3 lots with a total of 5 plague-infected ground squirrels were reported in Tulare County, Calif.

Yellow Fever

Brazil.—On February 26, 1934, 1 case of yellow fever with 1 death was reported in St. Mathew, Ceara State, Brazil

For the week ended April 28, 1934, 1 case of yellow fever with 1 death was reported in Mato Grosso State, Brazil, in a place distant from the seashore with no rail connections.

x

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 21

MAY 25 - - - - - 1934

IN THIS ISSUE

Illness Among Industrial Employees, 1933 and Prior Years
Production of Dibenzanthracene Tumors in Pure Strain Mice
Deaths in Large Cities During the Week Ended May 5, 1933
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93; title 44, section 220

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

	Page
Incidence of illness among male industrial employees in 1933 as compared with earlier years	615
The production of dibenzanthracene tumors in pure strain mice	620
Court decision on public health	624
Deaths during week ended May 5, 1934	
Deaths and death rates for a group of large cities in the United States	625
Death claims reported by insurance companies	625
PREVALENCE OF DISEASE	
United States	
Current weekly State reports	
Reports for weeks ended May 12, 1934, and May 13, 1933	626
Summary of monthly reports from States	628
Plague-infected ground squirrels in Tulare County, Calif	629
Cases of venereal diseases reported for March 1934	629
Weekly reports from cities	
City reports for week ended May 5, 1934	630
Foreign and insular	
Canada—Quebec Province—Communicable diseases—2 weeks ended May 5, 1934	634
Irish Free State—Vital statistics—Fourth quarter 1933	634
Panama Canal Zone—Communicable diseases—January–March 1934	635
Cholera, plague, smallpox, typhus fever, and yellow fever—	
Cholera	636
Plague	638
Smallpox	640
Typhus fever	645
Yellow fever	648

PUBLIC HEALTH REPORTS

VOL. 49 MAY 25, 1934 NO. 21

INCIDENCE OF ILLNESS AMONG MALE INDUSTRIAL EMPLOYEES IN 1933 AS COMPARED WITH EARLIER YEARS

By DEAN K. BRUNDAGE, *Statistician, Office of Industrial Hygiene and Sanitation, United States Public Health Service*

The frequency of cases of sickness causing absence from work for more than 1 week among a group of 152,203 male industrial employees was lower in 1933 than in any other year since 1921, when the record was started. Compared with 1932, the decrease in sickness incidence was substantial. This result is somewhat surprising, since the 1932 rates were below the average for the 5 preceding years.

The group under consideration is composed of male employees of 38 industrial firms, most of which are located in the North Central, North Atlantic, and New England States; but a number of employees of these companies are scattered in almost all parts of the country. The records on which the present report is based are those of sick-benefit organizations maintained either by the company or by its employees, or cooperatively by both

It is possible, of course, that the sickness rates might be higher if unemployed persons were included, but this consideration does not invalidate the year-to-year comparisons of sickness frequency among men working on a full-time or part-time basis. To some extent the decrease may be due to selection; i e., workmen on the pay rolls now may be somewhat healthier as a group than those employed in 1928 and 1929, when the demand for labor was greater. Selection, however, does not appear to be the all-important factor in the decreasing incidence of illness in our sample of the industrial population on account of the fact that the rates for certain important diseases which will be mentioned later were as high in 1932 and 1933 as in 1928 and 1929

The first month of 1933 was characterized by an outbreak of influenza, but the epidemic was so short-lived that the rate for the year as a whole was below the average frequency of this disease during the 10 preceding years. The influenza mortality rate in 1933 was

also less than the average for the 10 preceding years[1] Because influenza is of such numerical importance, the incidence rate of respiratory diseases, as a whole, fell well below the average, both for the 5 and for the 10 years preceding 1933. As an index of health conditions aside from influenza, the rate for all illnesses except influenza is shown in table 1. In 1933 this rate was the lowest of any year of record.

TABLE 1 —*Frequency of specified causes of disability lasting 8 consecutive calendar days or longer per 1,000 male industrial workers representing various industries, by years, from 1928 to 1933, inclusive*[1]

Year in which disability began	Sickness and nonindustrial injuries[2]		Sickness		Respiratory diseases[3]		Sickness exclusive of influenza		Nonrespiratory diseases		Average number of men, all reporting establishments
	A	B	A	B	A	B	A	B	A	B	
1928	113 4	111 2	102 5	100 2	50 6	48 8	73 4	72 8	51 9	51 4	163, 557
1929	112 4	110 6	99 9	98 1	47 8	46 8	73 9	71 9	52 1	51 3	194, 451
1930	94 1	93 8	81 8	81 6	32 0	32 3	68 5	68 2	49 8	49 3	188, 714
1931	94. 6	93 2	82 2	81 1	34 9	34 8	63 3	62 1	47 3	46. 3	171, 694
1932	97 5	94 7	84 9	82 3	37 6	37 0	62 9	60 4	47 3	45 3	163, 979
1933	82 3	76 8	71 0	66 2	28 6	25 6	55 7	53. 0	42 4	40 6	152, 203
5 preceding years[4]	102 4	100 7	90 3	88 7	40 6	40 0	68 4	67 1	49 7	48 7	176, 480

[1] For the record 1921 to 1927, inclusive, see Public Health Reports, vol 47, no 18, Apr 29, 1932, pp 997–1001.
[2] Industrial accidents and venereal diseases are not reported
[3] Title nos 11, 23, 104–115a, in the International List of Causes of Death, fourth revision, Paris, 1929
[4] 1928 to 1932, inclusive

A = all reporting establishments, B = establishments which reported throughout the 6 years ending Dec 31, 1933

The rates for bronchitis and for diseases of the pharynx and tonsils in 1933 fell to about 63 percent of the average for the 5 preceding years. So precipitous is this decline in incidence that one might well view the figures with skepticism were it not for the fact that the more serious respiratory diseases such as pneumonia and tuberculosis show decreases that are proportionately almost as large One searches in vain for a pneumonia case rate that was lower than the one recorded for 1933. Mortality from pneumonia also appears to have reached a new minimum. The Metropolitan Life Insurance Co states that a year (1933) which began with an influenza epidemic closed with the lowest pneumonia death rate in the history of insured wage earners.[2]

The frequency of new cases of respiratory tuberculosis in the industrial group under consideration was about 30 percent below the average for the 10 years preceding 1933. This result is not as spectacular as the reduction in tuberculosis mortality, amounting to 20 percent since 1930 in the industrial population of the country.[3]

[1] *Cf.* Statistical Bulletin, Metropolitan Life Insurance Co., vol XV, no 1, January 1934, p. 5.
[2] Idem.
[3] Ibid., p. 4.

TABLE 2.—*Frequency of specified respiratory diseases which caused disability for 8 consecutive calendar days or longer per 1,000 industrial workers representing various industries, by years, from 1928 to 1933, inclusive* [1]

Year in which disability began	Influenza and grippe (11)		Bronchitis, acute and chronic (106)		Diseases of the pharynx and tonsils (115a)		Pneumonia, all forms (107–109)		Tuberculosis of the respiratory system (23)		Other diseases of the respiratory system (104–105, 110–114)	
	A	B	A	B	A	B	A	B	A	B	A	B
1928	29 1	27 4	5 7	5 7	5 9	5 7	3 4	3 4	1 1	1 2	5 4	5 4
1929	26 0	26 2	5 3	5 2	7 2	6 3	3 1	3 2	1 2	1.1	5 0	4.8
1930	13 3	13 4	4 6	4 8	6 0	5 8	2 5	2 7	1 1	1 1	4.5	4 5
1931	18 9	19 0	3 6	3 6	5 2	5 0	2 1	2 2	1 0	1 0	4 1	4 0
1932	22 0	21 9	3 6	3 5	4 5	4.4	2 0	2 0	1 0	1 0	4 5	4.2
1933	15 3	13 2	2 9	2 8	3 9	3 4	1 8	1 7	8	8	3 9	3 7
5 preceding years	21 9	21 6	4 6	4.6	5 7	5 4	2 6	2 7	1 1	1 1	4 7	4.6

[1] For the record 1921 to 1927, inclusive, see Public Health Reports, vol 47, no 18, Apr 29, 1932, pp. 997–1001

A=all reporting establishments, B=establishments which reported throughout the 6 years ending Dec 31, 1933

Numbers shown in parentheses are disease title numbers from the International List of Causes of Death, fourth revision, Paris, 1929

In 1933 the rate for digestive diseases as a whole was approximately 18 percent below the average for the 5 preceding years. The important disease categories within this group, such as diseases of the stomach, diarrhea and enteritis, appendicitis, and hernia, show decreases of similar magnitude from the 5-year average.

TABLE 3.—*Frequency of specified diseases of the digestive system which caused disability for 8 consecutive calendar days or longer per 1,000 male industrial workers representing various industries, by years, from 1928 to 1933, inclusive* [1]

Year in which disability began	Digestive diseases, total (115b–129)		Diseases of the stomach, except cancer (117–118)		Diarrhea and enteritis (120)		Appendicitis (121)		Hernia (122a)		Other digestive diseases (115b, 116, 122b–129)	
	A	B	A	B	A	B	A	B	A	B	A	B
1928	14.6	14 5	4.7	4.8	1.3	1 2	4 2	4.2	1 8	1 7	2 6	2 6
1929	15 6	15 6	4 7	4.7	1.5	1.4	4.5	4.5	1 8	1 9	3 1	3 1
1930	14.8	14.5	4 7	4.7	1 5	1 5	4 0	3 7	1.7	1 8	2 9	2.8
1931	13 4	12 9	4 0	3 6	1 2	1 2	3 7	3 5	1 8	1.9	2.7	2.7
1932	13 3	12.6	4 0	3 7	1 0	1 0	3 4	3.3	1 9	1 9	3 0	2.7
1933	12 1	11 1	3 3	3 3	1 0	1 0	3 3	3 0	1 3	1 3	3.2	2 5
5 preceding years	14.3	14.0	4 4	4.3	1 3	1.3	4.0	3 8	1 8	1.8	2.8	2.8

[1] For the record 1921 to 1927, inclusive, see Public Health Reports, vol 47, no 18, Apr 29, 1932, pp 997–1001

A=all reporting establishments, B=establishments which reported throughout the 6 years ending Dec 31, 1933

Numbers in parentheses are disease title numbers from the International List of Causes of Death, fourth revision, Paris, 1929

For nonrespiratory, nondigestive diseases as a whole, a decrease in frequency amounting to about 15 percent below the average for the 5 preceding years is indicated Within this broad disease category however, not all subgroups participated in the decreased incidence of illness. The rate for diseases of the circulatory system in 1933 was practically the same as during the period 1928–32 A further subgroup, diseases of the heart, shows a lower rate than in 1932, but virtually the same incidence as the average for the 5 years preceding 1933, and a greater frequency than in any year of record prior to 1927. No change occurred in the frequency of diseases of the genito-urinary system except nephritis for which the rate was somewhat lower than during immediately preceding years. No improvement is indicated in the cancer situation The frequency of neurasthenia and kindred conditions decreased in 1933 as compared with 1932 and earlier years, but the rate for other diseases of the nervous system, which include such serious ailments as mental disease and cerebral hemorrhage, was slightly higher during the past year. On the favorable side may be mentioned decreases in the incidence of rheumatism (acute and chronic), diseases of the organs of locomotion, diseases of the veins, diseases of the skin, and the infectious and parasitic group of diseases.

Mortality records, insofar as they can be used for the purpose, indicate that the vitality of the American people has to date remained unimpaired in spite of the hardships which severe economic depression entails. The sickness records presented herewith indicate greater freedom from attacks of disease among men on the pay rolls of 38 large companies during the past 3 or 4 years than in the years immediately preceding the depression.

TABLE 4.—*Frequency of specified nonrespiratory, nondigestive diseases which caused disability for 8 consecutive calendar days or longer per 1,000 male industrial workers representing various industries, by years, from 1928 to 1933, inclusive* [1]

Year in which disability began	Nonrespiratory, nondigestive diseases, total		Diseases of the circulatory system, except diseases of the veins (90–99, 101–103)		Diseases of the veins (100)		Diseases of the heart (90–95)		Nephritis, acute and chronic (130–132)	
	A	B	A	B	A	B	A	B	A	B
1928	37.3	36.9	3.4	3.5	1.7	1.7	2.1	2.1	0.8	0.8
1929	36.5	35.7	3.4	3.5	1.7	1.7	2.2	2.3	.8	.8
1930	35.0	34.8	3.4	3.4	1.6	1.6	2.1	2.1	.7	.8
1931	33.9	33.4	3.2	3.2	1.8	1.5	2.0	2.1	.7	.7
1932	34.0	32.7	3.7	3.6	1.8	1.7	2.5	2.4	.8	.8
1933	30.3	29.5	3.4	3.2	1.4	1.4	2.1	2.1	.5	.6
5 preceding years	35.4	34.7	3.4	3.4	1.7	1.6	2.2	2.2	.8	.7

[1] For the record 1921–1927, inclusive, see Public Health Reports, vol. 47, no 18, Apr 29, 1932, pp 997–1001.

A=all reporting establishments, B=establishments which reported throughout the 6 years ending Dec. 31, 1933.

Numbers shown in parentheses are disease title numbers from the International List of Causes of Death, fourth revision, Paris, 1929.

TABLE 4 —*Frequency of specified nonrespiratory, nondigestive diseases which caused disability for 8 consecutive calendar days or longer per 1,000 male industrial workers representing various industries, by years, from 1928 to 1933, inclusive*—Continued

Year in which disability began	Other diseases of the genito-urinary system and annexa (133–138)		Neuralgia, neuritis, sciatica (87a)		Neurasthenia and the like (87b)		Other diseases of the nervous system (78–85)		Diseases of the organs of vision (88)	
	A	B	A	B	A	B	A	B	A	B
1928	2 2	2 2	2 2	2 2	1 4	1 4	1 0	1 0	1 1	1 1
1929	2 2	2 1	2 5	2 5	1 3	1 2	1 1	1 0	1 0	1 0
1930	2 4	2 3	2 3	2.2	1 2	1 2	1 0	1 1	1 1	1 1
1931	2.3	2 2	2 1	2 1	1 5	1 4	1 1	1 3	1 0	1 0
1932	2 3	2 1	2 3	2 3	1 3	1 1	1 2	1 2	9	8
1933	2 2	2 1	2 1	1 9	8	8	1 4	1 3	8	8
5 preceding years	2 3	2 2	2 3	2 3	1 3	1 3	1 1	1 1	1 0	1 0

Year in which disability began	Diseases of the ears and of the mastoid process (89)		Rheumatism, acute and chronic (56, 57)		Diseases of the organs of locomotion except diseases of the joints (156b)		Diseases of the skin (151–153)		Infectious and parasitic diseases [2] (1–10, 12–22, 24–33, 36–44)	
	A	B	A	B	A	B	A	B	A	B
1928	0 7	0 7	6 4	6 3	4 0	3 9	4 4	4 4	4 0	3 9
1929	7	6	5 6	5 6	3 9	3 9	4 2	4 2	3 9	3 5
1930	5	5	5 6	5 6	3 5	3 5	3 8	3 8	3 8	3 5
1931	7	6	5 4	5 4	3 3	3 5	3 2	3 3	3 3	2 9
1932	7	7	5 3	5 5	3 3	3 6	2 7	2 7	2 7	2 1
1933	6	6	4 9	4 9	2 8	3 0	2 7	2 6	2 0	1 8
5 preceding years	7	6	5 7	5 7	3 6	3 7	3 7	3 7	3 5	3 2

Year in which disability began	Cancer, all forms (45–53)		Other general diseases [3] (54, 55, 59–77)		Diseases of the bones and joints (154–156a)		Ill-defined and unknown causes of disability (200)		Nonindustrial injuries (163–198)	
	A	B	A	B	A	B	A	B	A	B
1928	0 4	0 3	1 2	1 1	0 7	0 7	1 7	1 7	10 9	11 0
1929	4	4	1 2	1 2	8	7	1 8	1 8	12 5	12.5
1930	5	5	1 2	1 2	7	8	1 7	1 7	12 3	12.2
1931	6	6	1 2	1 2	6	6	1 9	1 9	12 4	12 1
1932	6	6	1 7	1 7	4	5	2 3	1 7	12 6	12 4
1933	5	5	1 7	1 6	5	6	2 0	1 8	11.3	10 6
5 preceding years	5	5	1 3	1 3	6	7	1 9	1.7	12 1	12 0

[2] Except influenza, respiratory tuberculosis, and the venereal diseases

[3] Includes nutritional diseases, diseases of the endocrine glands, diseases of the blood and blood-making organs, chronic poisonings and intoxications

THE PRODUCTION OF DIBENZANTHRACENE TUMORS IN PURE STRAIN MICE

By H B ANDERVONT, *Biologist, Office of Field Investigations of Cancer, United States Public Health Service*

Burrows, Hieger, and Kennaway (1) have shown that the compound 1:2:5:6–dibenzanthracene, when injected subcutaneously in lard solution, is capable of producing sarcomas in mice. In their experiments the compound induced tumors in 31 out of 93 mice Seven primary growths were used for serial transmission experiments, of which two were carried at least as far as the twelfth and sixteenth generation.

Because of the inconsistent results obtained in their transmission experiments and the fact that no mention was made of any particular strain of mice, it is assumed that Burrows, Hieger, and Kennaway did not use pure strain animals. Therefore, it was considered of interest to ascertain the results attending the injection of 1·2:5.6–dibenzanthracene into pure strain mice The purpose of such an experiment would be twofold First, to determine whether the compound is capable of inducing tumors in pure strain animals which exhibit a low incidence of spontaneous tumors, as well as in other strains showing a high incidence of spontaneous tumors; second, to determine whether these induced tumors in pure stocks would follow the rule of the genetic theory of transplantation, namely, that a spontaneous tumor arising within an individual of a strain can be transplanted to members of the same strain, but not to members of another strain This report deals briefly with the results of a single experiment conducted along these lines.

EXPERIMENTAL ANIMALS

All pure strain mice were obtained from the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Maine. The mice used in the experiment are described below.

Strain A.—Inbred since 1918. Albino mice with a high incidence of spontaneous tumors in breeding females.

Strain M "Leaden."—Inbred since 1921. Color the same as strain D to be described below. These mice show a low incidence of spontaneous tumors.

Strain C_3H—Inbred since 1921. Color of wild house mice. The breeding females have a high incidence of mammary carcinomas.

Strain CBA.—Inbred since 1921. Color of wild house mice. No tumor has been observed in the mice of this strain for the past 10 generations.

Strain D.—Inbred since 1909. Dilute brown color. Breeding females exhibit an extraordinarily high incidence of spontaneous tumors.

Stock mice.—Mice purchased from a local dealer. Albino mice were used to compare the reaction of "market mice" to pure strain mice when subjected to injections of dibenzanthracene-lard solution.

Only adult mice weighing at least 20 g were used. All female mice were virgins

TECHNIQUE

A solution of 1.2.5 6–dibenzanthracene in lard was prepared as follows: The lard was filtered at 38° C., and dibenzanthracene was then added in the proportion of 4 mg to each cubic centimeter of lard. The lard was heated to 140° C, at which temperature the compound was completely dissolved. The control lard was also heated to 140° C. Both the dibenzanthracene-lard solution and the control lard were cooled to room temperature and then kept at +4° C. until used. Before using, both were heated to 40° C.

The injections were made by means of an 18-gage needle and a 1-cc syringe All injections were made subcutaneously in the right axillary region.

EXPERIMENTAL OBSERVATIONS

The experimental animals consisted of 558 mice, distributed among the various strains as follows

Strain	Number of experimental animals	Number of controls
Strain A	125	63
Strain M	102	50
Strain C_3H	19	10
Strain CBA	58	31
Strain D	23	13
Stock	41	23

The time of injections and amounts given were as follows.

	Cubic centimeter
Aug 3, 1933	0 25
Aug 18, 1933	0 25
Nov. 1, 1933	0 50

The first two injections produced subcutaneous lumps which persisted without showing any evidence of being absorbed. Therefore, on October 24, 1933, these masses were broken by pressure. What bearing this procedure had on the final outcome of the experiment is unknown.

The first tumor was noted on November 16, 1933, only 15 days after the last injection. Hence the necessity for the final injection was not established.

Following the appearance of the first tumor, the mice were examined each week, with the exception of the 17th, 21st, and 24th weeks following the first injection. As a routine procedure, any mouse dying was

autopsied and examined macroscopically for the presence of tumor. Pieces from every tumor were fixed in Tellyesniczky's fluid.

The experiment was discontinued on February 8, 1934, just 27 weeks after the initial injection The results of the experiment are shown in table 1. The lard-control mice are omitted from the table, since none developed tumors during the entire period of observation.

TABLE 1 —*Results of injection of dibenzanthracene in lard*

Strain	Sex	Number of mice injected	Died from other causes	Number of mice developing tumor	Percent	Living on Feb 8, 1934
A	Male	60	21	27	45	12
A	Female	65	16	31	48	18
M	Male	30	4	20	67	6
M	Female	72	18	18	25	36
C_3H	Male	9	4	5	55	0
C_3H	Female	10	4	6	60	0
CBA	Male	22	12	8	36	2
CBA	Female	36	8	23	64	5
Stock	Male	12	10	2	16	0
Stock	Female	29	11	7	24	11
D	Male	23	3	6	26	14
Total		368	111	153	41	104

It is seen that the dibenzanthracene-lard solution induced tumors in all five pure strain stocks as well as in the "market mice".

The time of appearance of tumors is shown in table 2. It is seen that the greatest number were observed from the nineteenth to the twenty-sixth week.

TABLE 2 —*Time in weeks of the appearance of dibenzanthracene-lard tumors in mice*

Time in weeks		15	16	17	18	19	20	21	22	23	24	25	26	27	Total number of tumors
Strain	Sex	Numbers of tumors observed													
A	Female	2	1	----	3	3	2	----	5	5	----	6	3	1	31
A	Male	2	1	----	----	1	3	----	5	3	----	7	5	----	27
C_3H	Female	1	1	----	----	1	1	----	1	1	----	----	----	----	6
C_3H	Male	1	1	----	----	2	1	----	----	----	----	----	----	----	5
CBA	Female	1	----	----	2	1	3	----	5	4	----	4	2	1	23
CBA	Male	----	----	----	----	----	----	----	1	2	----	4	1	----	8
M	Female	----	----	----	----	----	1	----	4	1	----	6	5	1	18
M	Male	----	----	----	1	2	2	----	6	5	----	1	2	1	20
Stock	Female	1	----	----	1	2	----	----	2	----	----	----	1	----	7
Stock	Male	1	----	----	----	----	----	----	1	----	----	----	----	----	2
D	Male	----	----	----	1	----	----	----	3	1	----	1	----	----	6
Total		9	4	----	8	12	13	----	33	22	----	29	19	4	153

LUNG TUMORS

As stated previously, the mice dying or killed were examined for macroscopic evidence of tumor in sites other than that where the dibenzanthracene-lard solution was injected. A number of tumors were found in the lungs, most of which were verified by histological

examination. The number of lung tumors in the various strains is listed below:

Strain A female	18
Strain A male	11
Strain CBA female	1
Strain M male	1
Stock female	3

It is not clear whether these tumors were metastases or primary lung tumors One lung tumor was observed in a mouse free of tumor at the site of the dibenzanthracene-lard injections This problem is receiving further consideration.

HISTOLOGICAL FINDINGS

In all, 50 of the 153 tumors arising at the site of injection were examined microscopically. Practically all were spindle-cell sarcomas. While most of the tumors were composed entirely of spindle cells, a few were of the mixed type, containing, in addition to the common spindle cells, considerable numbers of round or of giant cells One was apparently a mixture of carcinoma and sarcoma All sections showed active invasion of voluntary muscle. Further evidence of malignancy was obtained from transmission experiments described below.

TRANSPLANTATION EXPERIMENTS

In conformity with the purpose of the experiment, attempts were made to transplant the induced tumors into normal mice In all, 11 tumors were transplanted by grafts into mice of the same strain as the animal bearing the tumor, as well as into other pure strains or into stock mice. The usual trocar technique was employed in all these experiments The results are summarized in table 3.

TABLE 3.—*Results of transplantation experiments of dibenzanthracene-lard tumors*

Experiment no.	Strain in which tumor arose	Strains into which original tumor was transplanted																	
		Strain A			Strain C_3H			Strain CBA			Strain M			Strain D			Stock		
		Number of mice inoculated	Positive	Negative	Number of mice inoculated	Positive	Negative	Number of mice inoculated	Positive	Negative	Number of mice inoculated	Positive	Negative	Number of mice inoculated	Positive	Negative	Number of mice inoculated	Positive	Negative
1	A	8	8	0	8	0	8							8	0	8	8	0	8
2	A	3	3	0	6	0	6							6	0	6	6	0	6
3	A	3	3	0	6	0	6							6	0	6	6	0	6
4	A	3	3	0	3	0	3							5	0	5			
5	CBA				5	0	5	5	2	3				6	0	6			
6	CBA				5	0	5	5	3	2									
7	M				7	0	7				7	7	0	7	0	7			
8	M										12	12	0	6	0	6			
9	D				7	0	7							14	14	0			
10	D				4	0	4				8	0	8	15	15	0			
11	C_3H				18	18	0	8	0	8				6	0	6			

The results show clearly that the induced tumors are similar to spontaneous tumors arising within a pure stock, since they grew only in mice of the strain in which the tumor had its origin. No difficulty has been encountered in subsequent serial transmission of two of these tumors into animals of the same strain in which they originated.

SUMMARY

The results of the experiment confirm the findings of Burrows, Hieger, and Kennaway in showing that the subcutaneous injection of dibenzanthracene-lard solution induces sarcomas in mice. In addition, it has been shown that this solution induces tumors in pure-strain mice which, under normal conditions, do not develop spontaneous tumors Thus, it is shown that the genetic constitution of a pure strain of mice does not prevent the cells from becoming malignant when exposed to this carcinogenic agent.

Transmission experiments demonstrate that the induced tumors grow only in mice of the same strain in which they originated. In this respect they are similar to spontaneous tumors arising in pure-strain mice.

REFERENCE

(1) Burrows, H , Hieger, I , and Kennaway, E L Am. Jour Cancer, *16* (1932), p. 57.

COURT DECISION ON PUBLIC HEALTH

Measure of damages recoverable because of injury to real property by construction and operation of sewer and sewage disposal tank—(Kansas City, Mo., Court of Appeals; *Carpenter et al.* v. *City of Versailles*, 65 S W (2d) 957; decided Dec. 4, 1933) An action was brought against the city of Versailles to recover damages for injury to real property alleged to have been caused by the construction and operation of a sewer and sewage disposal tank In the trial court there was a verdict and judgment for the plaintiffs, and the city appealed.

The first of the plaintiffs' instructions was as follows·

> The court instructs the jury that, under the law and the evidence in this case, your verdict and finding must be for the plaintiffs on the claim for permanent damages and you will assess plaintiffs' damages in accordance with the further instructions in this case.

The court of appeals declared that this instruction was clearly erroneous, saying:

> * * * In it the court assumed that there were permanent damages, and upon so assuming told the jury to ascertain the amount thereof. Under the evidence the question as to whether or not there were permanent damages was for the jury. It was one of fact and not of law.

The plaintiffs made the contention that the said instruction was not erroneous for the reason that the discharge of sewage upon the land was wrongful and that, therefore, they were entitled to recover at least nominal damages. In answer the appellate court said

> * * * Nominal damages may be recovered for the invasion of a right, though actual damages were not sustained Permanent damages, however, may not be recovered without showing actual damages The court did not merely direct a verdict for plaintiffs as it could rightfully have done, but it told the jury that plaintiffs were entitled to recover for permanent damages. Such damages were not recoverable, unless the jury found as a fact that plaintiffs had sustained actual damages

The court declared the measure of damages to be the difference in the reasonable market value of the land immediately before and immediately after the appropriation. "The sewer system is a permanent structure, and the plaintiffs may not recover loss of rents."

The judgment was reversed and the cause remanded.

DEATHS DURING WEEK ENDED MAY 5, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 5, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	8,606	8,003
Deaths per 1,000 population, annual basis	12 0	11 2
Deaths under 1 year of age	626	608
Deaths under 1 year of age per 1,000 estimated live births	58	[1] 52
Deaths per 1,000 population, annual basis, first 18 weeks of year	12 5	12 0
Data from industrial insurance companies		
Policies in force	67,748,069	68,357,913
Number of death claims	13,221	12,654
Death claims per 1,000 policies in force, annual rate	10 2	9 7
Death claims per 1,000 policies, first 18 weeks of year, annual rate	11.0	10 9

[1] Data for 81 cities

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended May 12, 1934, and May 13, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 12, 1934, and May 13, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933
New England States								
Maine	3		1	2	39	3	0	0
New Hampshire					122	40	0	0
Vermont		1			58	3	0	0
Massachusetts	14	20		1	1,566	623	2	0
Rhode Island		2			56		0	1
Connecticut	2			4	90	305	0	0
Middle Atlantic States								
New York	39	80	[1] 9	[1] 12	1,205	3,205	3	5
New Jersey	18	33	12	4	689	1,575	0	1
Pennsylvania	39	56			3,880	1,635	3	6
East North Central States								
Ohio	29	41	67	122	1,944	610	3	0
Indiana	15	12	12	14	1,296	292	0	4
Illinois	29	20	19	15	2,700	791	8	15
Michigan	14	19	3	16	367	822	1	2
Wisconsin	3	2	43	20	2,558	458	1	1
West North Central States								
Minnesota	17	4		1	326	670	0	2
Iowa [2]	6	12	2		311	83	0	2
Missouri	48	24	41	8	883	202	6	3
North Dakota	2	6			213	115	0	0
South Dakota	3	3		2	256	17	0	0
Nebraska	12	6			423	184	2	1
Kansas	7	7	3		836	301	0	2
South Atlantic States								
Delaware	1	2		1	173	18	0	0
Maryland [2]	11	7	8	4	2,504	21	1	0
District of Columbia	11	6			94	30	0	1
Virginia	12	11			1,407	340	2	0
West Virginia	2	6	20	7	141	51	2	0
North Carolina	18	12	90	2	1,861	635	1	1
South Carolina	7	4	246	165	411	283	0	0
Georgia [3]	2	1		37	498	121	0	0
Florida	8	11	2	2	578	32	0	0
East South Central States								
Kentucky	11	7	13	12	418	17	1	1
Tennessee	5	4	21	30	487	45	2	4
Alabama [3]	9	7	36	11	645	157	3	3
Mississippi [3]	5	7					0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 12, 1934, and May 13, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933
West South Central States								
Arkansas	4	2	3	11	16	181	2	0
Louisiana	24	11	20	11	216	24	3	0
Oklahoma [4]	14	6	23	11	245	204	0	1
Texas [3]	72	54	171	108	774	1,569	1	4
Mountain States								
Montana [5]	5	3	25	2	89	24	0	0
Idaho [5]	....	....	....	3	34	29	1	0
Wyoming [5]	....	....	....	....	39	30	0	0
Colorado	11	5	....	27	1,082	10	0	0
New Mexico	3	3	....	....	98	8	0	0
Arizona	1	3	1	....	62	74	1	0
Utah	1	1	5	2	107	17	0	0
Pacific States								
Washington	1	3	1	1	197	65	0	1
Oregon [5]	1	....	....	28	43	97	1	0
California	39	30	23	37	731	1,388	2	2
Total	578	554	920	733	32,768	17,410	52	63

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933
New England States								
Maine	0	0	22	33	0	0	13	3
New Hampshire	0	0	21	8	0	0	0	0
Vermont	0	0	5	8	0	0	4	0
Massachusetts	1	1	198	305	0	0	2	2
Rhode Island	0	0	14	24	0	0	0	1
Connecticut	1	0	70	113	0	0	0	1
Middle Atlantic States								
New York	2	0	835	770	0	0	9	14
New Jersey	0	1	194	252	0	0	1	5
Pennsylvania	1	1	638	873	0	0	13	13
East North Central States								
Ohio	1	0	909	1,029	1	7	6	6
Indiana	0	1	113	127	1	2	3	2
Illinois	1	3	513	432	5	10	2	28
Michigan	1	1	629	508	0	0	7	5
Wisconsin	0	0	335	114	32	5	1	2
West North Central States								
Minnesota	0	0	90	93	6	0	1	0
Iowa [4]	0	0	41	22	4	8	1	1
Missouri	2	0	79	58	7	11	7	1
North Dakota	0	0	41	5	0	0	2	0
South Dakota	0	0	6	13	1	0	0	2
Nebraska	0	0	25	10	12	1	5	0
Kansas	0	1	31	51	8	2	4	2
South Atlantic States								
Delaware	0	0	11	15	0	0	3	0
Maryland [3]	1	0	38	81	0	0	14	6
District of Columbia	0	0	10	17	0	0	1	0
Virginia	0	0	24	34	0	0	10	6
West Virginia	0	0	57	24	0	0	7	5
North Carolina	0	0	18	37	1	2	2	7
South Carolina	0	0	2	4	0	0	7	17
Georgia [3]	0	0	4	10	1	0	3	8
Florida	0	1	2	2	0	0	4	2
East South Central States								
Kentucky	0	0	44	32	0	0	9	4
Tennessee	0	0	13	33	2	4	2	13
Alabama [3]	0	0	6	8	0	23	0	7
Mississippi [3]	0	0	13	5	0	0	2	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 12, 1934, and May 13, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933	Week ended May 12, 1934	Week ended May 13, 1933
West South Central States								
Arkansas	1	0	8	4	1	3	5	4
Louisiana	0	0	27	8	6	1	14	16
Oklahoma [4]	0	1	16	7	4	37	1	4
Texas [3]	2	2	45	52	37	31	15	13
Mountain States								
Montana [5]	1	0	15	6	1	0	1	6
Idaho [5]	1	0	3	3	14	3	1	1
Wyoming [5]	0	0	2	11	12	0	0	0
Colorado	0	0	15	28	5	4	0	0
New Mexico	0	0	13	5	0	0	0	1
Arizona	10	0	5	5	0	0	1	0
Utah	0	0	8	4	4	0	0	0
Pacific States								
Washington	0	2	40	50	2	7	8	3
Oregon [5]	0	0	36	37	6	11	3	1
California	20	1	172	150	1	42	11	7
Total	46	16	5,456	5,520	174	214	205	221

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended May 12, 1934, 9 cases, as follows Georgia, 4, Alabama, 3, Texas, 2
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended May 12, 1934, 20 cases, as follows Montana, 9, Idaho, 2, Wyoming, 5, Oregon 4

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April 1934										
Arizona	2	9	64		329	1	5	106	0	3
Indiana	6	68	73		3,953		1	721	2	28
Massachusetts	9	59			9,138	1	1	1,001	0	8
Missouri	17	171	420	56	3,993		1	415	22	21
New Jersey	5	57	77	1	2,885		1	850	0	14
New York	5	256		11	4,608		4	3,505	0	33
North Carolina	4	69	185		10,321	66	2	110	7	4
North Dakota		12	26		782		0	154	0	3
Wyoming	1	4			358		0	37	8	1

April 1934

	Cases
Chicken pox.	
Arizona	84
Indiana	395
Massachusetts	1,000
Missouri	368
New Jersey	1,608
New York	2,543
North Carolina	673
North Dakota	61
Wyoming	40
Dysentery:	
Arizona	11
Massachusetts (amoebic)	2
Missouri	9

April 1934—Continued

	Cases
Dysentery—Continued	
New Jersey	3
New York (amoebic)	9
New York (bacillary)	8
North Dakota (amoebic)	1
German measles	
Arizona	93
Massachusetts	70
New Jersey	623
New York	214
North Carolina	215
Wyoming	2
Lead poisoning:	
Massachusetts	1

April 1934—Continued

	Cases
Lethargic encephalitis	
Massachusetts	7
Missouri	6
New Jersey	3
New York	7
Mumps.	
Arizona	22
Indiana	50
Massachusetts	549
Missouri	608
New Jersey	444
North Dakota	4
Wyoming	8

April 1934—Contd.

	Cases
Ophthalmia neonatorum	
Massachusetts	96
New Jersey	2
New York	7
North Carolina	1
Paratyphoid fever	
Massachusetts	1
New York	7
Rabies in animals	
Indiana	47
Massachusetts	25
Missouri	28
New Jersey	20
Rocky Mountain spotted fever	
Wyoming	20
Septic sore throat	
Massachusetts	18
Missouri	114

April 1934—Contd

	Cases
Septic sore throat—Con	
New York	74
North Carolina	5
Wyoming	23
Tetanus	
Massachusetts	2
Tick paralysis	
Wyoming	1
Trachoma	
Arizona	54
Massachusetts	2
Trichinosis	
Massachusetts	1
New Jersey	6
New York	9
Tularaemia	
Missouri	2
Wyoming	1
Typhus fever	
New York	1

April 1934—Contd

	Cases
Undulant fever	
Missouri	3
New Jersey	5
New York	41
North Carolina	1
Vincent's infection	
New York	[1] 78
North Dakota	4
Wyoming	2
Whooping cough	
Arizona	227
Indiana	413
Massachusetts	1,634
Missouri	1,098
New Jersey	946
New York	1,710
North Carolina	1,477
North Dakota	65
Wyoming	8

[1] Exclusive of New York City

PLAGUE-INFECTED GROUND SQUIRRELS IN TULARE COUNTY, CALIF.

The Director of Public Health of the State of California has reported that on May 9, 1934, 3 lots of ground squirrels, including 7 animals, were found to be plague infected They were from Tulare County, near Fountain Springs, in the interior of California.

CASES OF VENEREAL DISEASES REPORTED FOR MARCH 1934

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases The figures are taken from reports received from State health officers They are preliminary and are, therefore, subject to correction It is hoped that the publication of these reports will stimulate more complete reporting of these diseases

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama [1]				
Arizona	42	0.93	134	2.96
Arkansas	357	1.91	199	1.06
California [2]	1,005	1.66	787	1.30
Colorado [1]				
Connecticut [2]	205	1.25	118	.72
Delaware	96	3.98	34	1.41
District of Columbia	151	3.05	109	2.20
Florida	306	1.97	51	.33
Georgia	431	1.48	502	1.72
Idaho	0		0	
Illinois	1,618	2.07	1,396	1.78
Indiana	160	.49	122	.37
Iowa [4]	131	.53	160	.64
Kansas	111	.59	52	.27
Kentucky	232	.88	359	1.36
Louisiana	122	.57	111	.52
Maine	57	.71	47	.59
Maryland	597	3.59	190	1.14
Massachusetts [2]	370	.87	487	1.13
Michigan [3]				
Minnesota	393	1.52	308	1.19
Mississippi	983	4.80	1,580	7.72
Missouri	527	1.44	394	1.07
Montana [2]	22	.41	29	.54
Nebraska	43	.31	72	.52
Nevada [1]				
New Hampshire [3]				
New Jersey [3]				
New Mexico [2]	42	.97	25	.58
New York	5,519	4.26	1,326	1.02
North Carolina	1,116	3.41	384	1.17

See footnotes at end of table.

CASES OF VENEREAL DISEASES REPORTED FOR MARCH 1934—Contd.

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
North Dakota	31	49	54	79
Ohio	473	68	207	30
Oklahoma [2]	157	64	118	48
Oregon	108	1 10	72	73
Pennsylvania	337	34	219	.22
Rhode Island	78	1 11	39	56
South Carolina [2]	599	3 43	647	3 70
South Dakota [3]	------------	------------	------------	------------
Tennessee	1, 162	4 36	530	1. 99
Texas [2]	54	09	7	01
Utah [1]	------------	------------	------------	------------
Vermont	17	47	18	50
Virginia	840	3 44	360	1 47
Washington	88	55	185	1 16
West Virginia [3]	------------	------------	------------	------------
Wisconsin [4]	44	15	95	32
Wyoming	0	------------	4	17
Total	18, 633	1 71	11, 531	1 06

[1] Not reporting

[2] Incomplete

[3] Have been reporting regularly but no report received for current month

[4] Only cases of syphilis in the infectious stage are reported

NOTE —Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6 6 for syphilis and 10.2 for gonorrhea

WEEKLY REPORTS FROM CITIES

City reports for week ended May 5, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	1	0	1	7	3	0	0	0	11	18
New Hampshire											
Concord	0	------	0	5	1	0	0	0	0	2	8
Manchester	0	------	------	3	------	4	0	------	0	0	5
Nashua	0	------	------	17	------	2	0	------	0	0	------
Vermont											
Barre	0	------	0	0	0	0	0	1	0	0	5
Burlington	0	------	------	0	------	1	0	------	0	8	6
Massachusetts											
Boston	1	------	0	186	29	51	0	17	0	60	226
Fall River	0	------	0	0	1	2	0	0	0	3	25
Springfield	0	------	0	3	0	2	0	1	0	11	35
Worcester	1	------	0	2	5	10	0	2	1	11	54
Rhode Island:											
Pawtucket	0	------	0	0	0	0	0	0	0	0	20
Providence	16	------	0	0	3	14	0	4	1	6	50
Connecticut											
Bridgeport	0	------	0	0	0	22	0	0	0	0	29
Hartford	0	------	0	0	1	7	0	1	1	0	52
New Haven	0	------	1	0	2	2	0	1	0	3	23
New York:											
Buffalo	4	------	0	64	29	15	0	13	0	7	168
New York	34	12	5	229	175	329	0	85	3	117	1, 579
Rochester	0	------	1	2	3	55	0	1	0	7	73
Syracuse	0	------	0	50	2	3	0	2	0	[illegible]	[illegible]

City reports for week ended May 5, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
New Jersey											
Camden	0	1	1	21	4	14	0	1	0	0	33
Newark	0	------	0	35	5	14	0	5	0	26	100
Trenton	1	2	0	98	0	13	0	0	0	0	33
Pennsylvania											
Philadelphia	2	3	2	502	42	112	0	36	0	40	497
Pittsburgh	11	4	3	295	28	34	0	5	1	26	212
Reading	2	------	0	3	1	4	0	1	0	4	30
Scranton	0	------	------	3	------	7	0	------	0	7	------
Ohio											
Cleveland	5	25	3	161	26	157	0	13	0	95	194
Columbus	0	1	1	1	12	58	0	7	0	42	101
Toledo	2	2	1	110	6	39	0	7	0	118	83
Indiana											
Fort Wayne	2	------	0	38	1	8	0	2	0	1	32
Indianapolis	0	------	0	416	12	14	0	7	1	36	------
South Bend	0	------	0	12	2	4	0	0	0	0	22
Terre Haute	1	------	0	0	2	3	0	0	0	0	27
Illinois											
Chicago	7	2	6	563	64	270	0	31	1	141	721
Cicero	------	------	0	------	1	------	------	0	------	------	7
Springfield	2	1	0	79	1	1	0	0	0	15	25
Michigan											
Detroit	7	2	1	122	27	151	0	20	0	173	305
Flint	0	------	0	27	0	100	0	1	0	15	17
Grand Rapids	0	------	0	4	3	16	0	2	0	3	39
Wisconsin											
Kenosha	0	------	------	1	------	9	0	------	0	2	9
Madison	0	------	------	14	------	3	0	------	0	12	14
Milwaukee	1	1	1	54	10	111	0	4	0	85	125
Racine	0	------	0	2	0	10	1	1	0	5	14
Superior	0	------	0	3	1	0	0	0	0	0	13
Minnesota											
Duluth	0	------	0	0	3	0	0	0	0	0	30
Minneapolis	1	------	1	19	9	12	0	2	0	21	116
St Paul	1	------	0	10	8	8	0	4	0	36	70
Iowa											
Davenport	0	------	------	19	------	4	0	------	0	0	------
Des Moines	2	------	------	0	------	23	0	------	0	0	32
Sioux City	0	------	------	36	------	1	0	------	0	0	------
Waterloo	0	------	------	------	------	0	0	------	0	10	------
Missouri											
Kansas City	5	------	0	5	10	30	0	6	0	10	115
St Joseph	5	------	0	14	3	1	0	1	1	1	14
St Louis	15	2	3	39	14	23	0	11	0	55	265
North Dakota:											
Fargo	0	------	0	33	0	0	0	0	0	9	12
Grand Forks	0	------	------	0	------	0	0	------	0	2	------
South Dakota:											
Aberdeen	0	------	------	36	------	2	0	------	0	8	------
Sioux Falls	0	------	------	4	------	0	0	------	0	0	6
Nebraska.											
Omaha	2	------	0	150	7	17	5	1	0	10	53
Kansas											
Topeka	0	------	0	15	2	0	0	0	0	27	4
Wichita	0	------	0	45	4	2	0	1	0	35	25
Delaware.											
Wilmington	0	------	0	32	4	1	0	0	0	2	31
Maryland											
Baltimore	0	2	0	1,780	18	34	0	17	6	118	233
Cumberland	1	------	0	10	1	3	0	0	0	9	11
Frederick	------	------	------	------	------	------	------	------	------	------	------
District of Col											
Washington	3	2	1	97	15	10	0	8	0	35	158
Virginia											
Lynchburg	0	------	0	19	0	0	0	1	0	8	14
Norfolk	0	------	0	13	2	0	0	1	0	2	23
Richmond	0	------	1	167	5	0	0	4	0	0	45
Roanoke	1	------	0	3	3	1	0	0	0	7	20
West Virginia.											
Charleston	0	------	0	15	2	1	0	0	0	9	18
Huntington	0	------	------	0	------	8	0	------	0	0	------
Wheeling	0	------	1	7	1	18	0	1	0	9	19

City reports for week ended May 5, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
North Carolina											
Raleigh	0	------	0	7	1	0	0	1	0	23	17
Wilmington	0	------	0	0	4	0	0	0	0	0	17
Winston Salem	0	1	1	8	1	0	0	1	0	8	12
South Carolina											
Charleston	0	7	1	18	0	1	0	2	1	1	26
Columbia	0	------	0	0	1	0	0	0	0	0	20
Greenville	0	------	0	1	1	0	0	0	0	2	8
Georgia											
Atlanta	1	5	1	45	7	1	0	3	1	2	79
Brunswick	0	------	0	10	0	0	0	0	0	0	5
Savannah	0	7	1	50	1	0	0	1	0	4	20
Florida											
Miami	1	------	1	211	1	1	0	4	1	4	26
Tampa	0	1	1	166	3	0	0	2	0	0	25
Kentucky											
Ashland	0	------	------	50	------	0	0	------	0	0	------
Lexington	1	------	0	36	1	2	0	2	0	13	20
Louisville	6	1	1	67	4	15	0	0	0	53	74
Tennessee											
Memphis	2	------	1	51	14	2	0	8	0	20	92
Nashville	0	------	1	4	6	0	0	1	0	4	60
Alabama											
Birmingham	1	3	0	71	4	3	0	6	1	1	61
Mobile	0	------	0	2	1	1	0	3	1	0	23
Montgomery	1	------	------	51	------	0	0	------	0	1	------
Arkansas											
Fort Smith	0	------	------	0	------	0	0	------	0	0	------
Little Rock	0	------	0	9	1	3	0	0	0	1	2
Louisiana:											
New Orleans	18	1	0	45	11	7	0	11	0	1	145
Shreveport	1	------	0	9	3	1	0	8	0	2	37
Oklahoma											
Oklahoma City	1	------	0	0	11	2	0	2	0	0	49
Texas											
Dallas	9	2	2	------	8	3	0	1	0	21	51
Fort Worth	1	------	0	1	4	5	1	1	3	8	------
Galveston	0	------	0	0	2	0	0	0	0	0	14
Houston	9	------	0	5	6	3	3	6	1	0	76
San Antonio	0	------	0	10	2	0	1	2	0	0	52
Montana											
Billings	0	------	0	0	0	0	0	0	0	1	7
Great Falls	0	------	0	10	2	0	0	0	0	1	6
Helena	0	------	0	0	0	0	0	0	0	0	3
Missoula	0	------	0	0	0	0	0	0	0	5	5
Idaho:											
Boise	0	------	0	5	1	0	0	1	0	2	9
Colorado											
Denver	1	31	1	466	8	7	0	5	0	67	74
Pueblo	0	------	0	15	0	1	0	0	0	12	9
New Mexico											
Albuquerque	1	------	0	56	0	3	0	0	0	5	7
Utah											
Salt Lake City	0	------	0	39	1	9	0	1	0	83	22
Nevada:											
Reno	0	------	0	10	1	0	0	0	0	4	5
Washington:											
Seattle	1	------	------	4	------	23	1	------	0	53	------
Spokane	0	------	0	3	2	2	0	0	0	20	25
Tacoma	0	------	0	6	2	0	0	1	0	7	23
Oregon:											
Portland	1	------	0	20	4	20	0	0	1	18	63
Salem	0	------	------	1	------	0	0	------	0	0	------
California:											
Los Angeles	17	13	0	44	11	49	0	15	1	58	234
Sacramento	2	------	0	3	0	1	0	2	0	8	27
San Francisco	1	1	1	216	3	13	0	4	0	17	137

City reports for week ended May 5, 1934—Continued

State and city	Meningococcus meningitis		Polio-mye-litis cases	State and city	Meningococcus meningitis		Polio-mye-litis cases
	Cases	Deaths			Cases	Deaths	
Massachusetts				Missouri			
Boston	1	0	0	Kansas City	1	1	0
Springfield	0	1	0	St Louis	2	1	0
New York				Virginia			
New York	4	1	2	Lynchburg	0	1	0
New Jersey				Richmond	0	1	0
Newark	1	0	0	North Carolina			
Pennsylvania				Winston-Salem	1	1	0
Philadelphia	2	1	1	Alabama			
Pittsburgh	3	2	0	Birmingham	1	0	0
Ohio				Oklahoma			
Cleveland	2	1	1	Oklahoma City	2	0	0
Toledo	1	1	0	Oregon			
Illinois				Portland	0	0	1
Chicago	10	4	0	California [1]			
Minnesota				Los Angeles	1	0	2
Minneapolis	1	0	0				
Iowa							
Sioux City	0	1	0				

Lethargic encephalitis.—Cases Chicago, 1, Detroit, 1, Washington, 1

Pellagra.—Cases Boston, 2, Atlanta, 1, Savannah, 1, Nashville, 1, Birmingham, 1, New Orleans, 2; Dallas, 1, Los Angeles, 2

[1] For the week ended May 12, 1934, 7 cases of poliomyelitis were reported in Los Angeles City, Calif, and 8 cases in the county of Los Angeles outside of the city For the week ended May 12, 1934, the State of California reported 20 cases of poliomyelitis, and for the week ended May 19, the State reported 36 cases.

FOREIGN AND INSULAR

CANADA

Quebec Province—Communicable diseases—2 weeks ended May 5, 1934.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended May 5, 1934, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	2	Ophthalmia neonatorum	4
Chicken pox	141	Poliomyelitis	2
Diphtheria	43	Puerperal fever	3
Dysentery	1	Scarlet fever	125
Erysipelas	10	Tuberculosis	110
German measles	21	Typhoid fever	41
Influenza	2	Undulant fever	1
Lethargic encephalitis	1	Whooping cough	211
Measles	626		

IRISH FREE STATE

Vital statistics—Fourth quarter 1933—The following statistics for the Irish Free State for the fourth quarter ended December 31, 1933, are taken from the quarterly return of marriages, births, and deaths, issued by the registrar general, and are provisional:

	Number	Rates per 1,000 population		Number	Rates per 1,000 population
Population	2,992,000		Deaths from—Continued.		
Marriages	3,354	4 50	Diphtheria	128	
Births	13,768	18 40	Influenza	164	0 22
Total deaths	9,730	13 00	Measles	14	
Deaths under 1 year	933	(1)	Puerperal sepsis	29	[2] 2.11
Deaths from:			Scarlet fever	25	
Cancer	842	1 13	Tuberculosis (all forms)	791	1 06
Diarrhea and enteritis (under 2 years)	158		Typhoid fever	20	
			Whooping cough	66	

[1] Deaths under 1 year per 1,000 births, 68.
[2] Per 1,000 births.

PANAMA CANAL ZONE

Communicable diseases—January–March 1934.—During the months of January, February, and March 1934, certain communicable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities, as follows:

Disease	January		February		March	
	Cases	Deaths	Cases	Deaths	Cases	Deaths
Anthrax					1	
Chicken pox	19		30		47	
Diphtheria	20		14	2	10	1
Dysentery (amoebic)	21	2	23	1	5	1
Dysentery (bacillary)					1	1
Leprosy			1		1	1
Malaria	183	6	117	2	66	3
Measles	10		3		6	
Mumps	3		1		1	
Pneumonia		29		20		19
Relapsing fever	1					
Scarlet fever					1	
Tuberculosis		31		11		22
Typhoid fever	2	1	4		2	
Typhus fever			1		1	
Whooping cough	14		14		24	

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given.

CHOLERA

[C indicates cases, D, deaths, P, present]

Place		Oct 1–28, 1933	Oct 29–Nov 25, 1933	Nov. 26–Dec 30, 1933	Dec 31, 1933–Jan. 27, 1934	Week ended—												
						February 1934				March 1934					April 1934			
						3	10	17	24	3	10	17	24	31	7	14	21	28
India	C	9,939	7,571	8,161	4,458	1,036	956	1,153	1,317	1,207	1,872	2,029						
	D	4,846	3,923	3,799	2,439	476	492	510	591	506	813	910						
Bombay Presidency	C	1,376	1,100	1,204	434	78	37	59	89	42	20	21		24				
	D	634	594	639	231	42	22	29	35	27	7	13		11				
Bombay	C	4	1	4	1										3		2	2
Calcutta	C	68	55	63	78	37	16	41	32	40	40	108	82	111	124	129	180	141
Chittagong	C	1		4	2						3	1			3	1		3
Madras Presidency	C	727	1,039	2,708	1,344	165		334	250	151	237	170						
	D	292	453	1,012	552	54		131	105	66	101	60						
Madras	C	4	6	121	16		6	9			2	1	1					
	D	1	4	56	6		1	5			1		1					
Rangoon	C										1					1		
Vizagapatam	C	1																
India (French).																		
Chandernagor	D							2							3			
Karikal	C			2	5													
Pondichery	C														1			
India (Portuguese)	C				1									1				
Indo-China (see also table below) Rachgia	C												1					
Philippine Islands [1]																		
Antique Province	C	17	8	8														
	D	16	6	6														
Bohol Province	C	87	173	140	292	30	29	66	95	62	49	13	12	3	2			
	D	47	101	94	200	21	19	41	61	41	26	7	6	4	2			
Cebu Province	C	63	71	75	34	1								1				
	D	36	45	54	30	1								1				
Cebu	C	21	17		1	1												
	D	8	8		1	1												
Naga	C		18	4	2													
	D		9	3	1													

Iloilo Province	C	12	2		1													
	D	11	3		1													
Iloilo	C		2															
	D		3															
Occidental Misamis Province	C								1									
Occidental Negros Province	C			9	27		7	5	1			2	34	12	3			
	D			6	23		4	6	1			1	19	11	3			
Oriental Negros Province	C			6	96	13	4	27	3	12	13	5	2	1				
	D			6	52	10	2	19	3	7	6	5	5	1				
Samar Province	C	[2] 20										18						
	D	[2] 14										18						
Siam	C					1												
Bangkok	C								1									
On vessel: S.S. Chyebassa at Calcutta	C											1						

Place		October 1933			November 1933			December 1933			January 1934			February 1934			March 1934	
		1–10	11–20	21–31	1–10	11–20	21–30	1–10	11–20	21–31	1–10	11–20	21–31	1–10	11–20	21–28	1–10	11–20
Indo-China (French) (see also table above)																		
Cambodia [3]	C											2	2	1	1			
	D											1		1	1			
Cochin-China [3]	C	5	5					2	1	1		1	2	1	1	4	1	5
	D	5	3					2	1	1		1	2	1	1	3	1	5

[1] No cholera was reported in the Philippine Islands during the week ended May 12, 1934
[2] For the month of October 1933
[3] Reports incomplete

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE[1]

[C indicates cases, D, deaths, P, present]

Place		Oct 1–28, 1933	Oct 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Dec 31, 1933–Jan 27, 1934	Week ended— February 1934: 3	10	17	24	March 1934: 3	10	17	24	31	April 1934: 7	14	21	28
Angola[3]																		
Argentina (see also table below) Buenos Aires Province	C					1												
	D					1												
Azores: Ponta Delgada	C				4													
	D				1												1	
Belgian Congo Stanleyville Province	C																	
Bolivia (See table below)																		
British East Africa (see also table below)																		
Kenya	C	18	37	21	19	2	1	4			2		2					
Tanganyika	D		1								4							
Uganda	C	63	81	77	44	8	6	7	6	4	2	6	1					
	D	61	79	72	42	8	6	7	6	4	1	6	1					
Ceylon: Colombo	C	1		1	1			1	1	1		2	3		3	3	2	6
	D	1		1	1			1	1	1		2	3		1	4	1	4
Plague-infected rats				1	3	3			1		1						1	1
China: Manchuria[3]																		
Dutch East Indies West Java	C	[4] 816	1,568	1,671	1,960	419	518	601										
	D	[4] 814	1,560	1,576	1,955	419	518	601										
Egypt																		
Alexandria	C			1														
Asyut	C				1	2	1	1					1	2	2	17	5	2
Faiyum	C	1			1						1							1
Gharbiya	C	2			1													
	D	3			1													
Girga	C						3											
France: Marseille—Plague-infected rats			1															
Hawaii Territory: Hawaii Island—Hamakua—Plague-infected rats			2	5	1													
India	C	11,755	11,037	12,687	16,894	3,929	4,645	4,307	4,716	4,808	6,365	4,015						
	D	6,430	5,921	7,338	10,915	2,528	3,143	2,867	2,996	3,110	4,633	2,838						
Bassein	C			1	5				3	3	3	3	1		1	2	2	2
Plague-infected rats				2					1	1	2					2		
Bombay Presidency	C	4,922	5,799	5,501	4,906	1,127	1,225	1,340	1,179	841	837	478		459				
	D	2,928	3,621	3,555	3,235	719	783	865	744	573	541	346		347				

Bombay	C	3	1	1	1	5	6	5	1	1	1	1	2	4		2	2	
Plague-infected rats		1	8	1		2	2	4	1	2	4	10		2	1		16	
Poona	C	475	61															
	D	527	53															
Calcutta	C			[5] 1														
	D			[5] 1														
Delhi	C																	1
Madras Presidency	C	521	537	676	881	209		147	143	145	134	82						
	D	294	257	317	497	110		83	97	76	69	51						
Rangoon	C	1	1			3	1	3					1	2		1	1	1
Plague-infected rats			2	3	1		1	2	1	3	1					1		1
India (Portuguese)	C					2					1	5						
Indo-China (see also table below)																		
Pnom-Penh	D	2		1	1	1								2				
Saigon and Cholon	C				1									1				
Iraq: Baghdad	C	1	2	5	1	1	1				1							
Libya	C			11	2													
	D			6	1													
Madagascar. (See table below.)																		
Peru. (See table below)																		
Portuguese West Africa	C						P											
Senegal. (See table below)																		
Siam	C					3					1	1			4			
South-West Africa [6]																		
Union of South Africa.																		
Cape Province	C		18	3														
Orange Free State	C			1	13						1							
Transvaal	C			1														
United States—California [7]																		
Kern County—Plague-infected ground squirrels														17	11	36	8	9
Santa Clara County—Plague-infected ground squirrels				1														
Tulare County—Plague-infected ground squirrels														10	7	27	9	
On vessels:																		
S S Angkor at Beirut from Marseille	C	1																
At Tuticorin from Colombo	C							1										

[1] Including plague in the United States and its possessions
[2] During December 1933 and January 1934, 32 cases of plague with 17 deaths were reported in Angola
[3] A report dated Nov 13, 1933, states that plague was reported in Manchuria, China, as follows Fengtien Province, 249 cases, Hsingan Province, 200 cases, Jehol Province, 81 cases· Kirin Province, 479 cases
[4] For 2 weeks
[5] Imported
[6] 116 cases of plague with 5 deaths were reported in Ovamboland, South-West Africa, from Jan 1 to Dec 2, 1933 Antiplague measures have been taken
[7] For the week ended May 5, 1934, 2 lots including 2 plague-infected ground squirrels were reported in Kern County, and 3 lots including 5 plague-infected ground squirrels were reported in Tulare County, Calif For the week ended May 12, 1934, 3 lots including 7 plague-infected ground squirrels were reported in Tulare County, Calif

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases, D, deaths, P, present]

Place		October 1933	November 1933	December 1933	January 1934	February 1934	March 1934
Argentina (see also table above)	C	6	4				1
	D	2	1				
Bolivia	C		5				
British East Africa (see also table above):							
Kenya	C	20	36	14	19		
Uganda	C	71	83	63	49	24	14
Indo-China (see also table above):							
Cambodia	D	8	2	1	2	4	17
Cochin-China	C			1	1	1	1
Madagascar	C				249		
	D				236		
Peru	C	18	19	12	7	6	10
Callao	C	7					
Senegal							
Dakar [8]	C	4	15	3	1	2	6
	D	9	10	3	1	2	6
Medina [8]	C	1	1	1			
	D	1	1	1			
Thies [8]	C						2

[8] Reports incomplete

SMALLPOX

Place		Oct. 1-28, 1933	Oct. 29-Nov. 25, 1933	Nov 26-Dec 30, 1933	Dec 31, 1933-Jan 27, 1934	Week ended— February 1934: 3	10	17	24	March 1934: 3	10	17	24	31	April 1934: 7	14	21	28
Algeria:																		
Algiers Department	C		1		2		1					2			2			
Constantine Department	C				1										1			
Arabia Oman Sultanate—Muscat (see also table below)	C										5							
Belgian Congo (see also table below)	C				4													
Bolivia (See table below)																		
Brazil																		
Porto Alegre (alastrim)	C	5	1	1	1													
Santos	C			4	2													

British East Africa																		
Kenya	C				67	7	13	722		12		[1] 467	4	71	23			
Tanganyika	C	52	202	71	39	16		15	19		19	8	25	4				
British Somaliland	C				18	9	3	1		7		8		4	2			
British South Africa.																		
Northern Rhodesia	C	16		116	1													
Southern Rhodesia	C				1			1										
Canada:																		
Alberta	C			1														
British Columbia	C												1		[2] 1	1		
Manitoba	C										[1] 1							
Ontario	C		1		[1] 1													
Prince Edward Island	C			[1] 1														
Quebec	C			1	1													
Saskatchewan	C								[1] 1									
Ceylon: Colombo	C		1															
China:																		
Amoy	C				2								1	3	3			
Canton	C		2	6	14		1	4	2	9	9	6	5	10	3	3	2	1
Dairen	C	3	17	127	68	100	39	19	12	14	18	30	34	27				
Hangchow	C		1	2	2		1		3	2	4		2	1	2			
Hankow	C			2							1							
Hong Kong	C		1	2	3	2		5	9	13	7	5	24	11	5	10	11	7
Kwantung Leased Territory	C				38	51		22	17	11			40		15			
Macao	D							3	1	2	2	3	3	3	2	4		1
Manchuria—Mukden [3]																		
Nanking	C			1		1	1	2			1		2	1	1			
Shanghai	C	3	17	57	108	29	26	30	28	43	35	35	49	26	32	29	32	26
South Manchuria Railway Zone	C				58	57		16	26	7			20					
Swatow	C	2	1		1				1	1				1	1			
Tientsin	C			1			1			2					1			
Dahomey (See table below.)																		
Ecuador. (See table below)																		
Egypt																		
Alexandria	C		3		5	1			2									
Aswan	C				34		19		5	7		5			12	6		
Asyut	C	40	7	30	7				1	2				2	2	2		
Beni-Suef	C	13																
Cairo	C			1					1		1	1	2	1	1	3	7	
Dakahliya	C			87	12								2					
Faiyum	C	1	13	3														
Gharbiya	C	2	7	8						5		2	1		2	2		
Girga	C	9		20	17		5		3	5		4	19	4				
Minya	C			32	172		68		37	17		30	18	8	5	6		
Qena	C	25	28	24	6		5						6	3	1			
Provinces	C	95	168	265	369	108	103		54		31	42	62	28	30	22		
Eritrea: Asmara	C											[2] 1						
Gold Coast	C										P							

[1] For 2 weeks
[2] Imported
[3] From Jan 1, 1934, to Feb. 9, 1934, 140 cases of smallpox with 17 deaths were reported in Mukden, Manchuria, China.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths, P, present]

Place		Oct 1–28, 1933	Oct. 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Dec 31, 1933–Jan 27, 1934	Week ended— February 1934: 3	Feb. 10	Feb. 17	Feb. 24	March 1934: 3	Mar. 10	Mar. 17	Mar. 24	Mar. 31	April 1934: 7	Apr. 14	Apr. 21	Apr. 28
Great Britain.																		
England and Wales	C	10	9	27	32	8	16	20	23	11	5	11	5	3	6	3	3	9
Blackburn	C				1			13	7	2	1	1						
	D					1			3									
London	C	10	9	27	31	8	16	16	15	9	4	10	5	3	6	3	2	9
London and Great Towns	C	10	9	27	32	8	16	19	23	11	5	11	5	3	6	3	3	9
Greece (see also table below) Salonika	C						3	3	3	3								
Honduras: Tegucigalpa	C																2	
India	C	4,699	5,677	10,824	12,154	3,837	5,564	5,313	6,439	4,967	8,329	6,888						
	D	1,079	1,232	2,707	2,937	918	1,149	1,313	1,330	1,047	1,868	1,501						
Bassein	C	12	12	33	62	23	17	13	17	11	6	2	10	3		3	3	1
	D	7	6	11	26	3	8	6	4	4	4	5	5	1		2	2	1
Bombay Presidency	C	599	673	1,385	1,591	448	537	777	803	809	873	900		872				
	D	91	115	286	336	90	95	127	158	123	155	135		190				
Bombay	C	4	4	20	31	26	11	8	11	10	9	14	12	11	11	11	7	13
	D	4	3	13	11	7	7	5	5	5	6	6	6	5	7	5	5	11
Calcutta	C	8	13	75	181	80	100	105	81	76	55	76	87	97	90	63	59	42
	D	3	5	42	115	48	58	78	61	56	42	46	66	68	65	56	49	35
Cochin	C	1			12	5	4	1	1	1	3	5	6	5	5	4		8
Karachi	C	2	1	4	15	3	4	8	6	14	8	6	3		3	3	6	2
Madras Presidency	C	2,432	2,479	2,297	3,862	1,191		1,286	1,984	2,317	2,452	2,844						
	D	507	447	372	711	197		297	276	360	443	405						
Madras	C	81	41	83	113	24	23	27	21	16	20	23	33	27	23	26		23
Negapatam	C	9	17	20	4							2				3		4
Rangoon	C	1	2	9	14	8	2	9	9	2	6	9	12	19	21	22	21	15
Tuticorin	C	1	6		4		6						1					
Vizagapatam	C	1	2	3	4	1	5	6	1	5	1	5	7	9	3	2	8	9
India (French):																		
Chandernagor	D				4		1	1					1		1			
Karikal	C	1	3	11	2			1	1	1		2	2	2				
	D	1	3	6	2					1			2	2				
Pondichery	C	101	71	93	76	28	32	36	26	37	32	30	56	24	41			
	D	63	32	50	43	11	18	16	14	25	14	16	27	17	22			
Indo-China (see also table below):																		
Haiphong	C				114	31	5	41	34	19	22	12	8	5	6	10	7	3
Pnom-Penh	C															1		

Saigon and Cholon	C			1									1					
Tourane	C																	6
Iraq	C	36	135	34	17	17					8					9		
Amara Liwa	C				19													
Baghdad	C	2	3	3	2	1	1	1		2	1				1			
Basra	C		3	1												4		
Japan	C					23	6				11		6					
Kobe	C														1			
Moji	C									2				1				
Osaka	C							1		1	1			1	1	1	1	
Tokyo	C				1								3		1			
Yokohama	C					2												
Lithuania. (See table below.)																		
Mexico (see also table below)																		
Chihuahua	D						1											
Guadalajara	D						1											
Juarez.[5]																		
Mexico, D F	C				2				12	1	2							
Monterrey	D		1	1				1										
Saltillo	D			2														
San Luis Potosi	D				1				1							1		
Tampico	C				2													
Torreon	D	2													1			
Vera Cruz	C	1	1								[2] 1							
Morocco. (See table below.)																		
Nigeria	C	166	509	184	39	[1] 159		[1] 778		[1] 167		[1] 570						
Lagos	C				7	1	2	3	9	3	3	4	3	6				
Nyasaland (See table below.)																		
Palestine	C									10	2	5						
Persia	C	45	12	25														
	D	5	5	2														
Teheran	C	11	8	3	8	5	1	2	2									
	D	4	2	2	5	3		1	2					1				
Peru. (See table below.)																		
Poland	C	1	1							1								
Portugal (see also table below):																		
Lisbon	C		1		5	2		1	1		1	1		2	1			1
Oporto	C	2	2				2										3	
Siam	C				1									4				[6] 24
Sierra Leone	C	534	578	260	143	[1] 162		[1] 27		[1] 76		[1] 105		[1] 248				
Spain	C	11	40		23		3	6		6	8	6	5	26	19	9		
Sudan (Anglo-Egyptian)	C		15	61	34	13	41	6	6	14	25	6	40	5	16	2	1	
Syria.																		
Beirut	C			20	61	12	8	13	12	7				1				
Provinces	C	34	35	44	101	8	14	12	4			12	6	11	19	5		31
Turkey. (See table below.)																		

[1] For 2 weeks.
[2] Imported.
[4] Includes 1 imported case.
[5] Dec. 18, 1933, 90 cases of smallpox were reported in Juarez, Mexico, with 18 deaths occurring from Dec. 1 to 16, 1933.
[6] For 4 weeks.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths, P, present]

On vessels.		
S.S Rhona at Penang from Madras	1 case	Nov. 2, 1933
S S Enterprise at Karachi	1 case	Dec. 5, 1933
S S Jaldurga at Rangoon from Gogalpore	1 case	Dec 6, 1933
S S Pembrokeshire at Hong Kong	Present	Dec 10, 1933
S S Cremer at Singapore from Penang and Belawan	1 death	Dec 28, 1933
S.S. Jufuku Maru at Chefoo from Dairen	Present	Jan 7, 1934
S S Haiching at Amoy	Present	Jan 19, 1934
S S Elysia at Suez from Bombay	1 case	Jan 31, 1934
S S Red Sea at Colombo from Singapore	2 cases	Jan 31, 1934
S.S. Talamba at Rangoon from Calcutta	1 case	Feb 9, 1934
S S Jaldurga at Rangoon from Gogalpore	1 case	Feb 14, 1934
S S Neuralia at Shanghai	1 case	Feb 14, 1934
S.S Varsova at Karachi from Bombay	1 case	Feb. 17, 1934
On vessels—Continued		
S S King City at Victoria	2 cases	Feb 19, 1934
S S Alice Moller at Shanghai	1 case	Feb 20, 1934
S S Ranpura at Bombay from Shanghai	1 case	Feb 26, 1934
S S Minnie Moller at Shanghai	1 case	Feb 27, 1934
S S Shantung at Hong Kong	Present	Mar 2, 1934
S S Pronto at Hong Kong	Present	Mar 12, 1934
S S Ekma at Rangoon from Calcutta	1 case	Mar 17, 1934
S S Norviken at Hong Kong	Present	Mar 17 1934
S S Sandviken at Hong Kong	Present	Mar 22, 1934
S S Moldavia at Port Said from Bombay	1 case	Mar 26, 1934
S S Hydrangea at Hong Kong from Swatow	1 case	Mar 28, 1934
S S Yuen Sang at Hong Kong from Swatow	1 case	Apr 3, 1934

Place		October 1933	November 1933			December 1933			January 1934			February 1934			March 1934
			1-10	11-20	21-30	1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-28	1-10
Dahomey	C	25	9	9	5										
	D	6	6	6											
Indo-China (see also table above)	C	137	24	22	11	54	65	63	92	99	124	113	145	231	201
	D	38	10	8		10	12	7	14	14	27	26	32	27	20

Place		October 1933	November 1933	December 1933	January 1934	February 1934	March 1934
Arabia (see also table above)	C			20			
	D			14			
Belgian Congo (see also table above)	C				126	178	
Bolivia	C	34	39	21			42
Ecuador	C				4		[1] 3
Greece (see also table above)	C	1	2			3	
Lithuania	C				49		
Mexico (see also table above)	C			7			
Morocco	C	3	16		1	1	2
Nyasaland	C	289	391	132	263		
Peru	C	23	21	25	19		
Portugal (see also table above)	C	214	323	128	111		
	D	31	21	16	19		
Turkey	C		12	17	23	16	

[1] Imported.

TYPHUS FEVER

Place		Oct 1–28, 1933	Oct 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Week ended— January 1934				February 1934				March 1934					April 1934		
					6	13	20	27	3	10	17	24	3	10	17	24	31	7	14	21
Algeria:																				
Algiers Department	C	1	-	9	-	-	-	-	-	-	1	3	-	-	6	6	-	-	6	-
Constantine Department	C	5	8	7	2	6	1	2	5	3	5	9	-	[1] 39	8	4	-	5	4	5
Bone	C	-	1	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Philippeville	C	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Oran Department	C	1	-	1	-	-	-	-	-	-	-	-	-	2	-	2	2	-	1	-
Australia Sydney	C	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-
Basutoland. (See table below)																				
Bolivia. (See table below)																				
British East Africa																				
Tanganyika	C	-	-	-	-	-	-	-	-	-	-	-	-	19	-	-	-	-	-	-
Uganda	C	2	2	5	-	-	1	1	-	1	-	1	-	3	12	-	-	-	-	-
Bulgaria	C	3	3	8	7	3	8	7	16	15	11	12	11	3	3	10	15	15	12	-
Chile	C	2, 620	2, 764	2, 714	368	308	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Antofagasta	C	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
San Pedro [2]																				
Santiago	C	1, 159	1, 211	1, 156	156	141	108	127	98	78	61	-	73	37	24	34	-	-	-	-
Valparaiso	C	43	54	58	4	5	2	4	3	4	2	7	5	3	1	-	-	-	-	-
China:																				
Hankow	C	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Harbin	C	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-
Kwantung Leased Territory	C	-	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Nanking	C	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	1	1	-	-
Shanghai	C	1	1	3	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
South Manchuria Railway Zone	C	-	-	-	-	-	-	3	-	-	1	2	3	-	-	-	-	-	-	-
Chosen. (See table below)																				
Czechoslovakia (See table below)																				
Egypt																				
Alexandria	C	-	-	2	-	-	1	3	-	-	-	2	1	7	2	3	1	-	2	2
Asyut	C	-	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Beheira	C	24	43	113	-	28	50	72	71	70	-	138	-	180	160	137	131	-	165	-
Cairo	C	-	-	-	-	-	-	-	-	-	-	1	1	4	1	1	-	4	2	2
Dakahliya	C	-	7	14	-	12	26	47	17	36	-	-	32	-	-	44	50	-	27	-
Damietta	C	-	-	1	-	-	-	-	-	-	-	-	1	12	1	3	3	5	2	1
Gharbiya	C	10	20	105	-	64	86	77	78	55	-	36	106	65	132	85	138	-	62	-
Girga	C	-	-	-	-	-	-	4	2	-	-	1	12	1	-	-	-	-	-	-
Minufiya	C	12	5	26	-	8	17	35	56	58	-	88	94	89	-	-	92	-	102	-

[1] For 2 weeks.
[2] Incomplete reports from San Pedro, Chile, for the month of November 1933 show 113 cases of typhus fever.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases, D, deaths, P, present]

Place		Oct 1–28, 1933	Oct 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Week ended— January 1934				February 1934				March 1934					April 1934		
					6	13	20	27	3	10	17	24	3	10	17	24	31	7	14	21
Egypt—Continued																				
Port Said	C															2			1	
Qena	C	3	6	2																
Provinces	C	52	108	278	110	116	180	238	226	219	271	284	351	387	431	381	427	394	405	
Greece. (See table below.)																				
Guatemala (See table below.)																				
Hungary	C	5	10							9	1	3	7	1	3					
Iraq:																				
Amara	C	4																		
Baghdad	C																		17	
Kirkuk Liwa	C																		30	
Ireland, Northern, Londonderry	C			1																
Irish Free State																				
Kerry County—Dingle	C	4	4																	
Killarney	C									1	1									
Roscommon County—Castlerea	C			3																
Waterford County—Lismore	C															1	1			
Japan:																				
Aomori Prefecture	C				3		10					2								
Kobe	C	1																		
Osaka	C		1																	
Lithuania	C			33	3	9	12	20	21	14	15	8	12	6	4	18	7	12	32	12
Mexico (see also table below)																				
Mexico, D. F.	C	14	46	46		31	32	20	18	18	24	18	27	28						
San Luis Potosi	D	1				1										2	1			
Torreon	C		3																	
Morocco (see also table below)	C	2		7	1	2	1		1	9		12	20	20	10	6	5	17	17	19
Palestine	C	4	4	2																
Persia	C	20	11	3		4	11		4	12	19	30	21	28		38	32	19		
Teheran	C						6	6	2	2	5	4	2	5	4	2	5	1		
Peru. (See table below.)																				
Poland	C	66	120	334	97	99	150	169	161	161	155	161	209	200	179	169	191	160	172	173
	D	5	10	19	6	6	13	9	4	15	11	8	12	19	7	12	10	12	6	

Rumania. (See table below.)																				
Scotland	C											1								
Spain: Madrid	C	1																		
Syria	C			15																
Trans-Jordan	C									2	1	5	5	3	3	2		1		7
Tunisia:																				
Tunis	C	2				1	1								1					1
Provinces	C								29		28	42	22	19	13	15	19	41	31	35
Turkey. (See table below.)																				
Union of South Africa. (See table below.)																				
Yugoslavia. (See table below.)																				

Place		October 1933	November 1933	December 1933	January 1934	February 1934	March 1934
Basutoland	C		366		362		
Bolivia	C	129	39	88			79
Chosen	C	3	8	4	3	1	
Czechoslovakia	C	1	12	14	7	17	112
Greece	C	3	5	3	2	2	
Guatemala	C		6	5	29	16	17
Mexico (see also table above)	C			75	94		
Morocco (see also table above)	C	2	1	8	4	30	54
Peru	C	55	341	137	15		

Place		October 1933	November 1933	December 1933	January 1934	February 1934	March 1934
Rumania	C	28	35	130	399	489	
Turkey	C	20	23	27	32	24	14
Union of South Africa							
Cape Province	C	166		63	109	220	
Natal	C	42			3	19	
Orange Free State	C	183		241	297	352	
Transvaal	C	24		8	11	3	
Yugoslavia	C	38	13	66	298	357	361

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

YELLOW FEVER

[C indicates cases, D, deaths, P, present]

Place		Oct 1–28, 1933	Oct 29–Nov 25, 1933	Week ended— December 1933: 2	9	16	23	30	January 1934: 6	13	20	27	February 1934: 3	10	17	24	Mar 3, 1934
Brazil																	
Acre Territory—Rio Branco	C							1									
Amazonas State—Esperanca	C							1									1
Ceara State—St Mathew	C																
Mato Grosso State [1]																	
French West Africa																	
Guinea	C					2			2								
Niger Territory	C	2															
Gold Coast.																	
Dunkwa	C									1							
Keta	C								1								
N'Kaw Kaw	C			1													
Togoland	C	[2] 1	1														
Ivory Coast Abengourou	C						1										
Nigeria Kano	C		1														
Senegal																	
Bakel	C	1															
Birkelane	C			2													
	D			1													
Dakar	C		1														
Kaffrine	C	1								1							
Kaolak	C			1							1						
Podor	C											[3] 1					
Sebikotane	C		1		1												

[1] For the week ended Apr. 28, 1934, 1 case of yellow fever with 1 death was reported in Mato Grosso State, Brazil, in a place distant from the coast and not connected by rail

[2] Suspected.

[3] Imported.

×

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 22

JUNE 1 - - - - 1934

IN THIS ISSUE

Frequency of Eye Refractions in Nine Thousand Families
Deaths in Large Cities During the Week Ended May 12
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93; title 44, section 220

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CONTENTS

	Page
Frequency of eye refractions in 9,000 families, based on nation-wide periodic canvasses, 1928-31	649
Court decision on public health	666
Deaths during week ended May 12, 1934	
Deaths and death rates for a group of large cities in the United States	667
Death claims reported by insurance companies	667
PREVALENCE OF DISEASE	
United States:	
Current weekly State reports	
Reports for weeks ended May 19, 1934, and May 20, 1933	668
Summary of monthly reports from States	670
Plague-infected ground squirrels in Kern and Tulare Counties, Calif.	671
Weekly reports from cities:	
City reports for week ended May 12, 1934	672
Foreign and insular:	
Canada—Provinces—Communicable diseases—2 weeks ended May 5, 1934	675
Cholera, plague, smallpox, typhus fever, and yellow fever—	
Cholera	675
Plague	675

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PUBLIC HEALTH REPORTS

VOL. 49 JUNE 1, 1934 NO. 22

FREQUENCY OF EYE REFRACTIONS IN 9,000 FAMILIES, BASED ON NATION-WIDE PERIODIC CANVASSES, 1928–1931[1]

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CONTENTS

	Page
Source and character of the data	650
Frequency of eye refractions	
At different ages	651
Among males and females	653
Among married and single persons	655
In different income levels	655
In different occupations	657
In urban and rural areas	658
Frequency of eye refractions—Continued	
Among those physically examined and those not examined	659
Reasons that brought person to have a refraction	661
Type of practitioner making the refraction	662
Summary	664
References	665

Eye refractions or examinations of the eyes do not clearly fall into the field of either preventive or therapeutic medicine. Many of them are solely for curative purposes, for the patient comes for refraction only when impairment of vision is such as to force him to procure glasses so that he may carry on his usual occupation or to relieve headache or other symptoms. On the other hand, the examination of the eyes is in some respects a preventive service like the health examination, and the wearing of lenses may prevent the development of various symptoms and complications.

Data on the proportion of individuals who have defective vision are available in many reports on school children and adults of various ages (1, 2, 3, 4, 7, 9, 10, 13). That many persons with impaired vision have never gone to an eye physician or to an optician and been fitted with glasses may be inferred from the large percentage of persons with considerable loss of vision who were not wearing glasses at the time they were examined (2, 13). But data are lacking on the

[1] From the Office of Statistical Investigations, U S. Public Health Service.

This is the third of a series of papers on sickness and medical care in this group of families (5, 6) The survey of these families was organized and conducted by the Committee on the Costs of Medical Care: the tabulation was done under a cooperative arrangement between the Committee and the Public Health Service. Committee publications based on the results deal primarily with costs and Public Health Service publications primarily with the incidence of illness and the extent and kind of medical care, without regard to cost. As costs are meaningless without some knowledge of the extent and nature of the service received, there is inevitably some overlapping.

Grateful acknowledgment is made for advice and assistance received in the course of the study from various members of the research staff of the Committee on the Costs of Medical Care, particularly Dr. I S. Falk and Miss Margaret C. Klem, and from members of the statistical staff of the Public Health Service. Special thanks are due to Miss Lily Vanzee, who was in immediate charge of tabulating the data

actual proportion of the total population who have an eye refraction in the course of a year.

SOURCE AND CHARACTER OF THE DATA

In connection with the study of illness in canvassed families in 130 localities in 18 States that was made by the Committee on the Costs of Medical Care and the United States Public Health Service (5, 8), all service received from physicians or other practitioners was recorded, whether for illness, eye refraction, physical examination, immunization, or other reason. These records afford data on the frequency of eye refractions in a fairly representative general population group The composition and characteristics of this group of 8,758 white families who were kept under observation for 12 consecutive months in the years 1928–31 have been discussed in some detail in preceding reports (5, 6, 8) These families, including a total of 39,185 individuals, resided in 18 States, representing every geographical section Every size of community was included, from metropolitan districts to small industrial and agricultural towns and rural unincorporated areas Although not identical with the general population, the persons in the observed families were fairly typical with respect to age and sex distribution, percentage native born, and percentage married With respect to income, their distribution was reasonably similar to the estimated distribution of the general population of the United States at the time of the survey.

Eye tests are almost invariably included as a part of a general physical examination The eye examinations considered in this study do not include refractions made incidental to such examinations, this report considers separate eye tests usually made for the purpose of fitting glasses, for in 88 percent of all the cases glasses were procured after refraction Some of the tests may have been made as a result of the finding of visual impairment by the physical examination, but in such cases they represent a second refraction for the individual.

FREQUENCY OF EYE REFRACTIONS

In the course of the year there were 40 eye examinations per 1,000 persons, exclusive of refractions made as a part of a general physical examination If it be assumed that each of the complete physical examinations, other than well-baby care, included a refraction, the total of all eye examinations would amount to 94 per 1,000 population. For persons 5 years old and over, there were 57 complete examinations and 46 other refractions per 1,000 or a total of 103. The annual number of eye refractions with or without a general physical examination appears to equal about 10 percent of the population under observation.

Of the 39 6 eye refractions per 1,000 population in the course of the year, 34 9 resulted in the procurement of lenses by purchase or gift, the other 4 7 per 1,000 being eye examinations without the purchase of lenses. In addition, there were 119 cases, or 3 1 per 1,000 persons, for the repair of glasses or replacement of broken lenses without refraction Since this report deals solely with eye examinations, repair cases without refraction are omitted from further consideration

FREQUENCY OF REFRACTIONS AT DIFFERENT AGES

Table 1 and figure 1 show refraction rates per 1,000 in rather detailed age groups There are practically no eye examinations under 3 and very few under 5 years of age. From 7 per 1,000 at 4 years, the frequency of refractions rises rapidly to 44 per 1,000 at 7 years. From 7 to 15 years there is a more gradual rise to a peak of 54 per 1,000 at 14–15, followed by a drop to 33 per 1,000 at 18–19, which marks the approximate level of the curve until nearly 40 years of age. From 40 to 55 the rate again rises rapidly to a maximum of 87 per 1,000 at 50–54 years After this peak the frequency of refractions declines to 33 per 1,000 for persons 70 years old and over, the approximate level of the rate from 18 to nearly 40 years

TABLE 1 —*Eye refractions per 1,000 persons of specific ages of each sex—canvassed white families in 18 States during 12 consecutive months, 1928–31*

Age in years	Both sexes[1]: Refractions per 1,000 population per year: All refractions	Both sexes[1]: Refractions per 1,000 population per year: Refractions and lenses bought	Both sexes[1]: Percentage of those refracted who bought lenses	Both sexes[1]: Population (years of life)	Refractions per 1,000 population per year: All refractions: Male	All refractions: Female	Refractions and lenses bought: Male	Refractions and lenses bought: Female	Total number of refractions: Male	Total number of refractions: Female	Population (years of life): Male	Population (years of life): Female
All ages[1]	30 6	34 9	88 2	38,544	33.1	45 8	28 7	40 9	626	899	18,896	19,627
Under 3	0 3			3,295								
3	6 5	5 6	85 7	1,072	3 2	2 6	1 8	2 6	9	7	2,808	2,684
4	7 0	5 2	75 0	1,146								
5	21 3	18 8	88 0	1,172								
6	30 2	23 3	77 1	1,158	37 6	34 2	29 8	28 0	106	99	2,820	2,895
7	44 4	38 4	86 5	1,171								
8–9	42 0	32 1	76 3	2,214								
10–11	49 0	42 4	86 6	1,980								
12–13	41 9	36 1	86 3	1,744	[2] 44 3	49 8	37 4	43 7	102	113	2,301	2,267
14–15	54 2	47 1	86 7	1,530								
16–17	50 9	43 2	84 8	1,296	[3] 38 6	52 5	34 1	44 0	59	80	1,527	1,523
18–19	32 8	27 2	82 9	1,068								
20–24	31 6	27 4	86 6	2,119	22 4	38 4	21 3	31 8	20	47	894	1,225
25–29	30 5	26 5	86 8	2,491	23 9	35 0	20 9	30 3	24	52	1,004	1,487
30–34	37 2	34.9	94 0	3,149	28 6	44 0	27 2	41 1	40	77	1,398	1,751
35–39	37 4	34 0	91 1	3,292	29 7	44 4	27 8	39 8	47	76	1,582	1,710
40–44	55 7	50 8	91 2	2,638	30 8	83 8	27 9	76 6	43	104	1,397	1,241
45–49	71 6	67 9	94 9	1,928	53 4	93 3	48 6	91 0	56	82	1,049	879
50–54	87.1	78 7	90 3	1,423	66 6	113 2	60 3	102 1	53	71	796	627
55–59	76 4	69 2	90 6	838	64 0	90 9	50 8	90 9	29	35	453	385
60–64	61 4	58 3	94 9	635	54 1	70 4	48 4	70 4	19	20	351	284
65–69	55.2	41 9	76 0	453	44 6	63 8	29 7	51 8	9	16	202	251
70 and over	33 0	27.5	83 3	545	21.3	41.9	17 0	35 5	5	13	235	319

[1] "All ages" includes a few of unknown age; "Both sexes" includes a few of unknown sex.
[2] 10–14 years.
[3] 15–19 years.

The first period of high refraction rates, from 7 to 17 years, is obviously associated with school life As will be seen later, very few of the refractions reported in this study were done in public clinics, and so these high rates do not appear to be a reflection solely of more

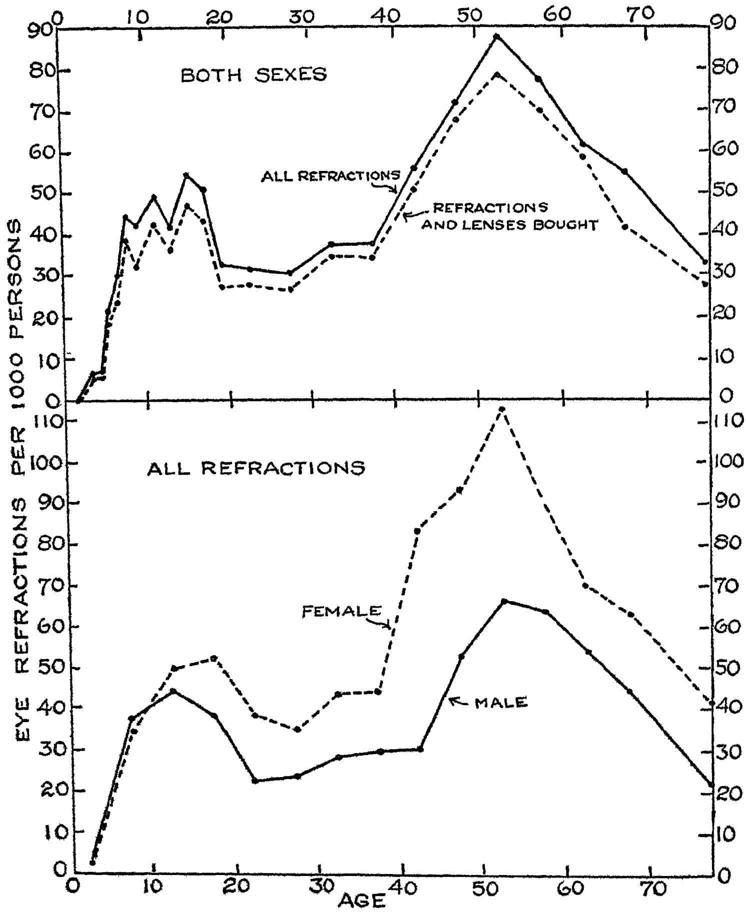

FIGURE 1 —Eye refractions per 1,000 persons of specific ages and for each sex—canvassed white families in 18 States during 12 consecutive months, 1928-31

accessible facilities for eye examinations during the school ages. The broken line on the graph (upper section of fig. 1) shows refractions per 1,000 in which the patient procured lenses as a result of the examination. This line is also high during the school ages, suggesting that

this period is a time of real stress for the eyes.[2] With rather close work in school, the higher rates, that indicate more eye difficulties, might be expected; the decrease in refractions that follows these ages is also reasonable, since many of the former school children would be in occupations that did not involve intensive use of the eyes.

The second rise in the frequency of eye refractions, which begins about 40 years of age, apparently marks the onset of presbyopia, or the failing of sight that comes with age The peak in the refraction rate at 50–54 years and its decline after that age is consistent with the observation that presbyopia gradually increases until about 60 years, and is likely to remain stationary after that age (12)

Data on industrial workers and life insurance policyholders (1, 3, 13) indicate a steady rise with age in the proportion of adults with defective vision as found by the Snellen and Jaeger tests. However, the rate of increase is greater from 40 to 50 years than at other ages

The broken line (upper part of fig 1), representing refractions with lenses purchased, follows very closely the line of total refractions. This close correspondence in the two curves for the various ages indicates that few persons, either children or adults, have their eyes examined unless there is considerable evidence of the need of glasses or a change of lenses.

FREQUENCY OF REFRACTIONS AMONG MALES AND FEMALES

Table 1 and figure 1 also show refractions among males and females of different ages. Under 10 years the rates are slightly greater for males than for females, but at all other ages eye refractions are considerably more frequent among females

Examinations of school children (2) and adults (13) in other studies indicate slightly more defective vision among females than among males except in the older ages[3] The greater frequency of eye refractions among females which is shown in figure 1 may be due to this greater prevalence of visual impairment, but other factors may be involved. Two such factors suggest themselves—the tendency of women toward more frequent general physical examinations, as shown in a preceding paper (6), and the fact that at least employed women, if not housewives also, are more largely in occupations that involve closer eye work than is true of men

Another striking contrast between the curves of eye refractions among males and females (fig 1) is the earlier rise among middle-aged

[2] That the school period is a time of real stress for the eyes of children is also indicated by the change in visual acuity during these ages. Former studies made by the Public Health Service investigators (2, 9, 10) indicate that the proportion of children with very poor vision (20/70 or worse) increases during the school ages. In another study (3) it was found that the increase with age in the proportion of persons with very poor vision occurred at a somewhat greater rate during the school ages (6–16 years) than during the years immediately following school life (ages 20–30).

[3] In the school ages the excess of defective vision of females over males appears to be confined to that of slight degree; the more serious defects are of approximately the same frequency in the two sexes.

adult females Among males the frequency of refractions remains on a low level through the 40–44 year group, but among females the low level continues only through the 35–39 year group, with a very marked rise at 40–44 years

A study of data on visual impairment of men and women of different ages by Sydenstricker and Britten (13) is useful in interpreting these differences Figure 2 shows the percentage of male and of female ordinary life-insurance policyholders of specific ages above 30 years that were found on examination by the Snellen and the

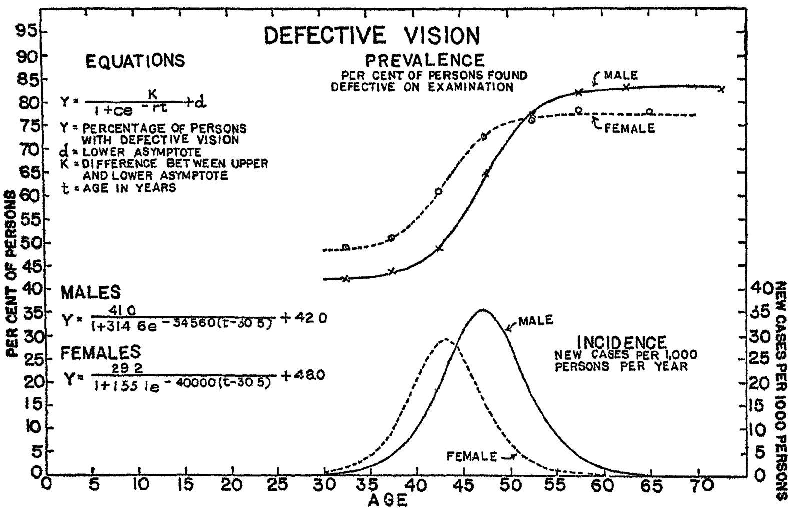

FIGURE 2 —Prevalence of defective vision (any degree, either eye) and the estimated annual incidence (new cases) among white males and females of specific ages above 30 years—based on eye tests made as a part of a general physical examination of 100,924 male and 11,694 female ordinary-life insurance policyholders by the Life Extension Institute The smooth curves of prevalence are logistics and the incidence curves are differences between the computed prevalence at successive ages (Original data from Sydenstricker and Britten (13))

Jaeger tests to have defective vision of any degree in either eye. Up to 50 years, more women than men were found to have defective vision. It is seen also that the rise in the rate that comes in middle life begins earlier among women than among men To determine the age when defective vision is increasing most rapidly, logistic curves were fitted to the data for males and females above 30 years of age and values computed for each age.[4] By subtracting the defective vision rate at one age from that in the next higher year of age, the proportion of persons who become defective during that

[4] No attempt has been made to apply the logistic curve to defective vision rates in the ages under 30 years. The percentage of children with defective vision actually decreases up to about 20 years of age (2, 3, 9, 11), but the decrease is all in the slight defects Likewise, in the early adult ages, defective vision rates are not represented by any extension of the growth curves shown in fig 2. The logistic plotting has been applied only to the ages above 30 years, when the development of presbyopia is the reason for the large increase in defective vision.

yearly age interval can be approximated. The lower curves in figure 2 are a plotting of these yearly differences, and they represent *new* cases of defective vision for each year of age The peak of the new cases occurs 4 years earlier in women (43 years) than in men (47 years). The difference between the sexes in the average (modal) age when presbyopia has its onset thus explains the earlier rise among females in the curve of the frequency of eye refractions, as shown in figure 1.

FREQUENCY OF REFRACTIONS AMONG MARRIED AND SINGLE PERSONS

In table 2 the frequency of refractions has been recorded for single and married persons of each sex for the ages 20–34 years Since the refraction rate is reasonably constant within those ages, the group can be considered as a whole Refractions are somewhat more frequent among married than among single men Among women the difference is much greater, the refraction rate of 64 for single women being nearly twice the rate of 33 per 1,000 for married women of the same ages. The occupational factor is suggested by this difference, because many single women are in clerical and similar occupations involving the use of the eyes to a greater extent than the work of a housewife. Moreover, the gainfully employed single women have their own incomes, and this would make for more frequent refractions apart from occupation

TABLE 2 —*Eye refractions per 1,000 single and married persons 20–34 years of age—canvassed white families in 18 States during 12 consecutive months, 1928–31*

Marital status	All refractions			Refractions and lenses bought			Both sexes	Male	Female
	Both sexes	Male	Female	Both sexes	Male	Female	Percentage of those refracted who bought lenses		
	Refractions per 1,000 persons 20-34 years of age								
Single	43.0	22.8	64.0	39.2	20.6	58.4	91.0	90.5	91.2
Married	30.7	26.7	33.4	27.4	25.0	29.1	89.4	93.7	87.2
	Number of refractions						Population (years of life)		
Single	78	21	57	71	19	52	1,812	922	890
Married	180	63	117	161	59	102	5,869	2,364	3,505

FAMILY INCOME AND FREQUENCY OF REFRACTIONS

Eye examinations, like other medical care, are more frequent in the higher income groups. Considering all ages, refraction rates rise steadily from 22 per 1,000 persons in families with an annual income of less than $1,200 to 102 in families with incomes of $5,000 or more per year. The rate for persons in families with incomes of $10,000 or

more is even higher, being six and one half times the rate in families with less than $1,200 income.

TABLE 3.—*Eye refractions per 1,000 persons in canvassed white families of different income levels in 18 States during 12 consecutive months, 1928–31*

Annual family income	Age: All ages [1]	Ages 5 years and over	Under 5	5–19	20–44	45–64	65 and over
	Refractions per 1,000 population per year						
Under $1,200	22.2	26.0	3.12	30.2	21.6	20.2	20.2
$1,200 but under $2,000	23.5	27.7	.90	27.7	23.4	45.7	17.7
$2,000 but under $3,000	36.0	41.3	5.11	36.6	36.5	67.6	58.2
$3,000 but under $5,000	49.5	54.7	3.76	50.0	53.9	65.7	64.3
$5,000 and over	101.5	110.2	5.22	109.0	84.4	161.3	74.1
	Number of refractions						
Under $1,200	129	126	3	66	38	17	5
$1,200 but under $2,000	315	309	2	132	112	60	5
$2,000 but under $3,000	342	334	7	119	129	75	11
$3,000 but under $5,000	243	238	2	80	102	47	9
$5,000 and over	476	470	2	157	141	160	12
	Population (years of life)						
Under $1,200	5,820	4,837	962	2,183	1,758	619	247
$1,200 but under $2,000	13,419	11,161	2,216	4,773	4,792	1,313	283
$2,000 but under $3,000	9,491	8,091	1,370	3,255	3,537	1,110	189
$3,000 but under $5,000	4,911	4,348	532	1,600	1,893	715	110
$5,000 and over	4,689	4,264	383	1,440	1,670	992	102

[1] "All ages" includes a few of unknown age

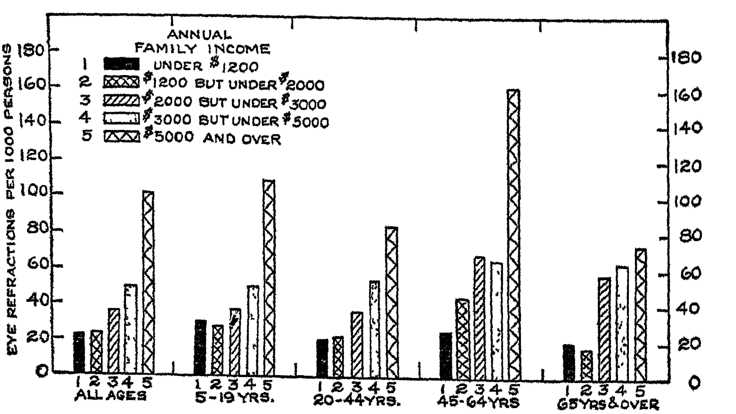

FIGURE 3.—Eye refractions per 1,000 persons of specific ages in different income levels—canvassed white families in 18 States during 12 consecutive months, 1928–31

Table 3 and figure 3 show refraction rates for persons of specific ages in families of different income levels. The tendency toward a

greater frequency of eye refractions as income increases is marked for every age group.

OCCUPATION AND FREQUENCY OF REFRACTIONS

The frequency of refractions among persons in different occupations is of particular interest because of the great variation in the use of the eyes If sufficient data were available, it would be worth while to compute rates for specific occupations, such as lawyers, clerical workers, carpenters, street laborers, and similar groups. The best that can be done with the available material is to consider rather broad occupational classes

TABLE 4.—*Eye refractions per 1,000 persons in certain occupations—canvassed white families in 18 States during 12 consecutive months, 1928–31*

Occupation	Refractions per 1,000 population per year				Number of refractions				Population			
	Total 15–64	15–24	25–44	45–64	Total 15–64	15–24	25–44	45–64	Total 15–64	15–24	25–44	45–64
	Males											
Professional men	87.6	34.5	55.3	148.9	58	1	22	35	662	29	398	235
Merchants and business men	66.1	------	50.3	94.0	87	------	38	49	1,316	39	756	521
Clerks and salesmen	42.3	7.6	37.0	86.8	62	2	33	27	1,464	262	891	311
Skilled and unskilled labor	18.8	11.7	16.2	29.7	75	7	39	29	3,984	597	2,412	975
Farmers and farm laborers	19.8	29.0	21.1	14.5	19	4	10	5	958	138	475	345
	Females											
Professional women	106.7	64.0	124.6	109.4	51	8	36	7	478	125	289	64
Clerks, saleswomen, and merchants	66.2	52.0	93.4	32.3	50	21	27	2	755	404	289	62
Skilled and unskilled labor	27.8	11.9	25.3	71.4	11	2	4	5	396	168	158	70
All housewives [1]	54.5	18.5	44.2	97.5	430	13	236	181	7,897	701	5,340	1,856
Town or city housewives	57.3	20.8	45.8	106.4	375	12	206	157	6,548	578	4,495	1,475
Farm housewives	40.8	8.1	35.5	63.0	55	1	30	24	1,349	123	845	381

[1] Housewife here means a person in charge of the home, and therefore includes a few single women

Table 4 and figure 4 show refraction rates in occupational groups. The frequency of refractions is much greater in professional, business, and clerical occupations than among skilled and unskilled laborers. If salesmen and clerical workers are considered in separate categories, the clerks are found to have somewhat higher refraction rates than salespeople of the same sex.

Among housewives the frequency of refractions is greater than among females in skilled and unskilled labor, but not as high as among clerks and saleswomen and much lower than among professional women. Refractions are more frequent among housewives who live in towns and cities than among those on the farm.

The refraction rate for farmers is only slightly above that for skilled and unskilled laborers and considerably below the rates for clerks and salesmen, business men, and professional men.

Refractions are much more frequent among persons 15–24 years of age who are attending school than among others of these ages.

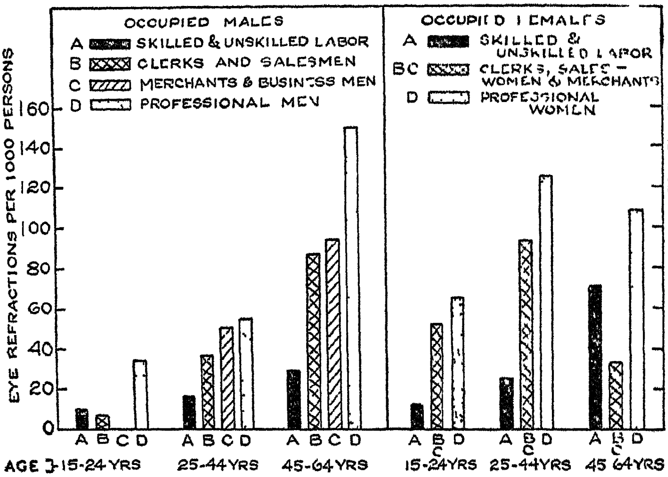

FIGURE 4.—Eye refractions per 1,000 males and females of specific ages in certain occupations—canvassed white families in 18 States during 12 consecutive months, 1928–31

FREQUENCY OF REFRACTIONS IN URBAN AND RURAL AREAS

Table 5 and figure 5 show refraction rates for persons living in cities and towns of different sizes and in rural unincorporated areas. Considering persons of all ages, refractions are considerably more frequent in cities than in rural areas; the rates in cities are about

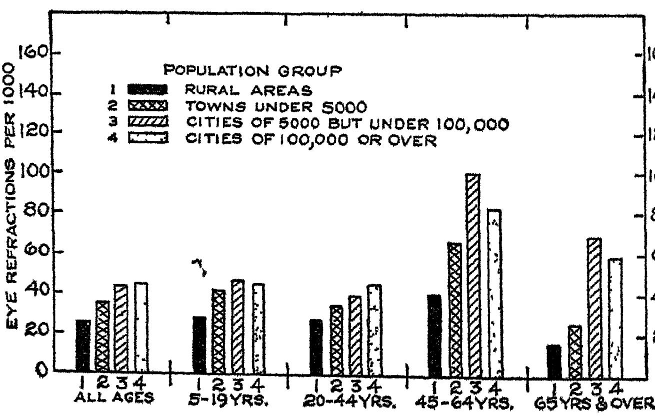

FIGURE 5.—Eye refractions per 1,000 persons of specific ages in cities, towns, and rural areas—canvassed white families in 18 States during 12 consecutive months, 1928–31.

45 per 1,000 as compared with 26 in the rural areas. Towns under 5,000 in population fall between these extremes, with 36 refractions per 1,000 persons in the course of the year The rates for cities over 100,000 and for cities of 5,000 to 100,000 population are approximately the same.

In the various age groups, the rates in towns under 5,000 are lower than those in either of the city groups, and the rates in rural areas are below those for towns under 5,000 in all groups except under 5 years, where the numbers are too small to be of any significance. It seems probable that these differences reflect variations in the character of the occupations in the different communities as well as income, custom, and other factors that influence the extent of medical and eye care.

TABLE 5.—*Eye refractions per 1,000 persons in urban and rural communities—canvassed white families in 18 States during 12 consecutive months, 1928–31*

Population of city or town	Age						
	All ages	All ages 5 years and over	Under 5	5–19	20–44	45–64	65 and over
	Refractions per 1,000 population per year						
Cities of 100,000 or over	44.9	51.1	4.58	45.8	44.4	83.6	59.3
Cities of 5,000 but under 100,000	44.2	51.9	3.26	47.3	39.7	100.7	69.9
Towns under 5,000	36.0	42.2	.88	41.8	35.5	66.3	26.0
Rural areas	25.9	29.2	1.14	28.5	26.1	41.1	16.4
	Number of refractions						
Cities of 100,000 or over	645	629	9	211	246	152	20
Cities of 5,000 but under 100,000	428	422	5	160	137	112	13
Towns under 5,000	273	271	1	112	92	61	6
Rural areas	179	175	1	76	55	40	4
	Population (years of life)						
Cities of 100,000 or over	14,351	12,304	1,963	4,609	5,540	1,818	337
Cities of 5,000 but under 100,000	9,694	8,128	1,535	3,381	3,449	1,112	186
Towns under 5,000	7,585	6,418	1,134	2,678	2,589	920	231
Rural areas	6,914	5,994	881	2,665	2,111	974	244

GENERAL PHYSICAL EXAMINATIONS AND SICKNESS AND THE FREQUENCY OF REFRACTIONS

Because the general physical examination usually includes an eye test and a recommendation that an oculist be consulted in cases where visual defect is found, it might be expected that there would be more eye refractions among those who had a general physical examination during the year. The eye refractions under consideration do not include those made as a part of a physical examination.

Table 6 and figure 6 show the proportion of persons who had refractions among those who had and who did not have general physical examinations, with each of these classes further subdivided according to whether the individual was sick during the year under observation

TABLE 6.—*Eye refractions*[1] *among persons classified according to whether they had a physical examination and according to whether they were sick during the year under observation—canvassed white families in 18 States during 12 consecutive months, 1928–31*

Physical examination and annual family income	Age and sickness during year											
	All ages 5 years and over			5–19 years			20–44 years			45 years and over		
	Total	Not sick	Sick	Total	Not sick	Sick	Total	Not sick	Sick	Total	Not sick	Sick
	Percentage of persons who had an eye refraction during the year[1]											
All incomes												
Had a physical examination	10.5	9.7	11.0	7.6	7.6	7.6	15.2	14.6	15.6	17.4	14.9	18.6
Had no physical examination	4.2	2.7	5.6	3.7	2.8	4.6	3.6	2.3	4.9	6.6	3.9	9.2
Family income under $3,000												
Had a physical examination	7.5	7.1	7.7	5.4	5.5	5.4	14.1	14.7	13.7	15.7	10.5	17.6
Had no physical examination	3.0	2.1	4.0	2.8	2.1	3.6	2.6	14.8	3.5	4.5	2.9	6.2
Family income $3,000 or over												
Had a physical examination	15.3	14.0	16.1	13.4	13.0	13.7	16.2	14.5	17.1	18.1	16.4	19.0
Had no physical examination	7.4	4.8	9.7	6.6	5.5	7.4	6.2	3.6	8.7	10.8	6.2	14.6
	Number of persons with eye refractions											
All incomes												
Had a physical examination	203	74	132	99	41	58	67	22	45	40	11	29
Had no physical examination	1,274	423	850	438	168	270	468	150	318	368	105	263
Family income under $3,000												
Had a physical examination	91	34	57	51	21	30	29	11	18	11	2	9
Had no physical examination	691	246	445	262	102	160	260	91	169	169	53	116
Family income $3,000 or over												
Had a physical examination	115	40	75	48	20	28	38	11	27	29	9	20
Had no physical examination	583	177	406	176	66	110	208	59	149	199	52	147
	Total number of persons under observation[2]											
All incomes												
Had a physical examination	1,969	764	1,205	1,299	539	760	440	151	289	230	74	156
Had no physical examination	30,671	15,399	15,272	11,951	6,050	5,901	13,151	6,647	6,504	5,569	2,702	2,867
Family income under $3,000												
Had a physical examination	1,217	479	738	941	385	556	206	75	131	70	19	51
Had no physical examination	22,809	11,741	11,068	9,269	4,854	4,415	9,820	5,028	4,792	3,720	1,859	1,861
Family income $3,000 or over												
Had a physical examination	752	285	467	358	154	204	234	76	158	160	55	105
Had no physical examination	7,862	3,658	4,204	2,682	1,196	1,486	3,331	1,619	1,712	1,849	843	1,006

[1] Exclusive of eye refractions done as a part of the physical examination. A few cases of repair of glasses without refraction are not separated from refractions but their numbers are insufficient to affect the results.
[2] All except about 1.5 percent were under observation during the whole 12 months.

In each age group a higher proportion of those persons who had a physical examination also had an eye refraction than of those who had no physical examination. Among persons who had physical examinations, about as many of those who were not sick had refractions as of those who were sick. However, among individuals who did not

have physical examinations during the year, a higher proportion of those who were sick had an eye refraction than of those who were not sick Considering all ages in this nonexamined group, twice as many of the sick had a refraction as of those who were not sick; in each of the three age groups the relative difference is of about the same order of magnitude.[5] Reference to table 6 indicates that in each of the

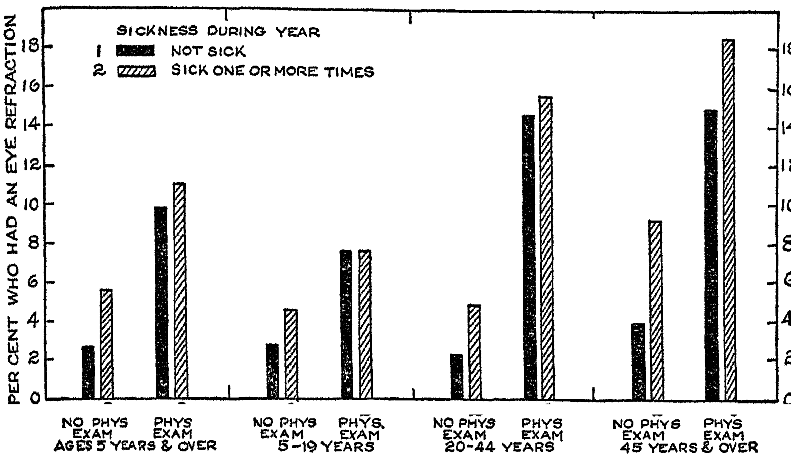

FIGURE 6 —Eye refractions among persons classified according to whether they had a physical examination and according to whether they were sick during the year under observation—canvassed white families in 18 States during 12 consecutive months, 1928-31

two income groups (under $3,000 and $3,000 and over per year) the same general picture is shown. The interpretation suggested by the data is that a physical examination, which usually includes an eye test, is likely to lead to a special eye refraction for glasses among a certain proportion of those examined; among those not examined, the general tendency to consider other impairments after an illness and the contact with the attending physician results in more refractions among those sick than among those not sick during the year.

REASONS THAT BROUGHT PERSON TO HAVE A REFRACTION

Of the 1,525 eye refractions made in this group in the course of the year, only 84, or 6 percent, were reported as done during or immediately following an illness which constituted the reason for having the examination. In 68, or 81 percent of these 84 cases, the illness was an eye condition.

[5] Those families whose physical examination records were complete would also be likely to render complete reports of eye refractions However, it does not appear probable that this factor is important enough to account for the large and consistent differences in the various age and income groups Moreover, those who reported sickness but did not report examinations do not have a high refraction rate.

TABLE 7.—*Reasons for having eye refractions—canvassed white families in 18 States during 12 consecutive months, 1928–31*

	Percentage of refractions done because of—					Number of refractions done because of—				
	All known reasons	Headache or other symptoms [1]	Recommended by physician, nurse, or teacher [1]	Regular school or other examination	Breakage of lenses	All known reasons	Headache or other symptoms [1]	Recommended by physician, nurse, or teacher [1]	Regular school or other examination	Breakage of lenses
All eye refractions	100.0	67.6	17.3	13.2	1.9	1,460	987	253	192	28
Lenses bought	100.0	67.8	17.3	12.7	2.2	1,294	878	224	164	28
No lenses bought	100.0	65.7	17.5	16.9	--------	166	109	29	28	--------

[1] "Headache or other symptoms" and also "recommended by a physician, nurse, or teacher" are classified as headache or other symptoms. Of the 987 who went for examination because of headache or other symptoms, in 126 cases the refraction was also recommended by a physician, nurse, or teacher. The total of examinations done on recommendation of a physician, nurse, or teacher was therefore 379, or 26 percent of all refractions. The corresponding figure for refractions and lenses bought was 25.6 percent, and for no lenses bought it was 28.9 percent.

Although definite illnesses associated with refraction are few, 68 percent of all who had eye examinations gave headache or other symptoms as the reason for having the refraction. In some of these cases it was reported that an eye examination had also been recommended by a physician, nurse, or teacher—9 percent of all refraction cases gave this joint reason for having the examination. Another 17 percent gave the recommendation of a physician, nurse, or teacher as the sole reason for having the refraction. Such a recommendation may have been made because symptoms or conduct that suggested eye troubles had been noted, or because the patient had been unable to read the test letters in a school or other physical examination. Thirteen percent of all refractions were designated as regular periodic examinations, and 2 percent were done when lenses already being worn were broken.

TYPE OF PRACTITIONER MAKING THE REFRACTION

Unlike health examinations and immunizations, eye refractions are largely in the hands of private practitioners. Less than 3 percent of all refractions considered in this study were made in public clinics, including those done by school physicians. The proportion in public clinics is greater among children; 5 percent of all refractions for persons under 20 years of age were done in public clinics, but only 0.5 percent of those for persons 45 years old and over (table 8).

TABLE 8.—*Proportion of eye refractions that were done by public clinics or other public facilities—canvassed white families in 18 States during 12 consecutive months, 1928–31*

Age in years	Percentage of refractions done in public clinics[1]		Number of refractions done in public clinics[1]		Total number of refractions	
	All refractions	Refractions and lenses bought	All refractions	Refractions and lenses bought	All refractions	Refractions and lenses bought
All ages[2]	2.7	2.5	41	34	1,525	1,345
Under 20	5.0	5.0	29	24	575	481
20–44	1.9	1.7	10	8	530	480
45 and over	.5	.5	2	2	408	372

[1] Refractions done by school physicians are included with those done in public clinics.
[2] "All ages" includes a few of unknown age.

Table 9 shows the number and percent of all refractions that were made by eye physicians (specialists), by physicians not designated as specialists, and by optometrists or opticians. In this tabulation refractions made in public clinics are included with those by physicians unless it was indicated that a specialist in the clinic made the examination. Of all refractions, 10 percent were reported as made by eye specialists. This figure must be considered a minimum, since a private specialist may have been reported merely as a physician and the work of a specialist in a clinic may have been reported as clinic service without further information. Fifty-six percent of the refractions were reported as made by physicians not designated as specialists, or a total of nearly two thirds of the refractions made by physicians (including eye physicians). The other refractions (35 percent) were made by optometrists or opticians. The high proportion of refractions reported as done by physicians suggests the possibility that optometrists were sometimes reported by the families as physicians, because they are frequently designated by the title "doctor." No data are available for comparison and there is no way to check the accuracy of the statement on the schedules.

TABLE 9.—*Proportion of eye refractions done by different types of practitioners and the proportion resulting in the purchase of lenses—canvassed white families in 18 States during 12 consecutive months, 1928–31*

	Percentage of all refractions that were done by—				Percentage of refractions by certain practitioners that resulted in purchase of lenses				Number of refractions done by—			
	All known practitioners	Eye physician (specialist)[1]	Other physician[1]	Optometrist or optician	All known practitioners	Eye physician (specialist)[1]	Other physician[1]	Optometrist or optician	All known practitioners	Eye physician (specialist)[1]	Other physician[1]	Optometrist or optician
All eye refractions	100.0	9.7	55.8	34.5	100.0	100.0	100.0	100.0	1,506	146	840	520
Lenses bought	100.0	9.0	54.7	36.3	88.3	82.2	86.5	92.9	1,330	120	727	483
No lenses bought	100.0	14.8	64.2	21.0	11.7	17.8	13.5	7.1	176	26	113	37

[1] Examinations by eye specialists in clinics are included with those by other specialists, other examinations in clinics are included with those by other physicians.

The middle section of table 9 shows the percent of refractions, by each type of practitioner, that resulted in the purchase of lenses. For the group as a whole, 88 percent of the refractions resulted in the procuring of lenses by purchase or gift It is significant that among those examined by eye physicians (specialists) only 82 percent bought lenses as compared with 87 percent for other physicians and 93 percent for optometrists and opticians The lower percentages for specialists and physicians suggest that eye and related physical troubles that are too complicated to be remedied solely by the fitting of lenses went largely to these practitioners On the other hand, the high percentage who procured lenses among those examined by optometrists or opticians may indicate that these practitioners prescribe glasses for nearly all patients. However, the same person here prescribes and dispenses lenses; under these circumstances some patients might procure glasses who would neglect to go to an optician even after receiving a prescription from a physician.

SUMMARY

Records of all medical and eye care were obtained on 8,758 white families in 130 localities in 18 States for a period of 12 consecutive months between February 1928 and June 1931. Each family was visited at intervals of 2 to 4 months to obtain the data.

The surveyed families include representation from nearly all geographic sections, from rural, urban, and metropolitan areas, from all income classes, and of both native- and foreign-born persons. The proportions of these various elements included are not identical with those in the population of the United States, but the variations are not generally large. In other respects also the surveyed group is not dissimilar to families in the general white population of the United States. In the course of the year under observation there were 40 eye refractions per 1,000 persons. In addition there were 54 complete examinations per 1,000 which would presumably include some kind of a test of the eyes.

There were 35 refractions per 1,000 in which the patient procured lenses by purchase or gift as a result of the examination. Lenses were procured in 88 percent of all refractions. There were also 3.1 cases per 1,000 of glasses repaired or lenses replaced without refraction.

The frequency of refractions varies greatly with age (fig. 1). During school ages, the frequency is greater than before or after those ages. A second peak with the highest rates comes at 50–54 years.

The frequency of refractions is greater among females than among males at all ages above 10 years (fig. 1). The abrupt increase in refractions in middle life that apparently parallels the onset of presbyopia begins 5 years earlier among women than among men. An analysis of published data on visual defects as found by the Snellen and

Jaeger tests indicates that the annual number of new cases of defective vision per 1,000 persons reaches its peak nearly 5 years earlier among women than among men (fig 2)

Fewer refractions were made among married than among single women of the same ages More refractions were made among married than among single men, but the difference was small

Refractions are more frequent in families with larger incomes than in the poorer classes (fig 3)

Refractions are more frequent in professional and clerical occupations than among skilled and unskilled laborers (fig 4)

Refractions are more frequent in cities than in rural areas (fig 5).

A larger proportion of persons who had a general physical examination also had a special eye refraction than of those who had no examination. Among those who had no physical examination, a larger proportion of those who were sick had an eye refraction than of those who were not sick (fig. 6).

Headache or other symptoms were given as the reason for the refraction in 68 percent of the cases.

Less than 3 percent of all eye refractions were done in public clinics. This is in contrast to physical examinations, of which 55 percent were done in public clinics.

Ten percent of all refractions were reported as made by eye physicians (specialists), 56 percent by other physicians, and 34 percent by optometrists or opticians.

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COURT DECISION ON PUBLIC HEALTH

Municipality not permitted to violate its zoning ordinance in erection of garbage-disposal plant.—(New York Supreme Court, Appellate Division; *O'Brien et al.* v. *Town of Greenburgh et al*, 268 N.Y.S. 173; decided Dec. 18, 1933) An injunction was sought by the plaintiffs, who were property owners and householders in the town of Greenburgh, to prevent the town from erecting a garbage-disposal plant upon property owned by it and situated in a zoning residence A district. Such district, under a zoning ordinance adopted by the town, was the most highly restricted area in the town, and the erection of the contemplated disposal plant in such area would have been a violation of the ordinance. The town had legislative authority for the enactment of a zoning ordinance and for the collection and disposal of garbage, refuse, and ashes.

The appellate court said that, briefly, the question presented was whether the town was precluded by its zoning ordinance from exercising the function of disposing of its garbage as proposed by it within the residence A district. The question was said to turn upon this proposition of law—whether the disposition of garbage and refuse constituted a corporate or a governmental function. "If corporate", said the court, "the plaintiffs are entitled to the relief sought, for the reason that in that capacity the town is bound equally with all other persons, whether individual or corporate, by the terms of its own ordinance. If governmental, the question of plaintiffs' rights may not be determined in advance of the construction and operation of the incinerator, especially in view of the refusal by the learned trial court to find upon the evidence that the operation of the plant will constitute a nuisance per se. With that ruling we are not inclined to interfere." The conclusions reached were that the disposal of gar-

bage by the town was a corporate or proprietary function and that the zoning ordinance as it then stood precluded the proposed construction by the town within the residence A district.

DEATHS DURING WEEK ENDED MAY 12, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 12, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	8,511	7,743
Deaths per 1,000 population, annual basis	11 9	10 8
Deaths under 1 year of age	637	578
Deaths under 1 year of age per 1,000 estimated live births	59	[1] 48
Deaths per 1,000 population, annual basis, first 19 weeks of year	12 5	11 9
Data from industrial insurance companies		
Policies in force	67,788,091	68,204,929
Number of death claims	13,538	13,435
Death claims per 1,000 policies in force, annual rate	10 4	10 3
Death claims per 1,000 policies, first 19 weeks of year, annual rate	11 0	10 8

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended May 19, 1934, and May 20, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 19, 1934, and May 20, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933
New England States								
Maine	1		1	2	10	1	0	0
New Hampshire					79	37	0	0
Vermont		1			65	34	0	0
Massachusetts	11	32			1,251	473	0	0
Rhode Island		2			11	1	0	0
Connecticut	3	5	1	3	156	281	1	1
Middle Atlantic States								
New York	56	60	[1] 6	[1] 11	1,089	2,428	2	6
New Jersey	15	19	27	2	817	1,073	1	0
Pennsylvania	61	51			4,011	1,296	4	2
East North Central States								
Ohio	12	13	10	11	1,080	529	6	0
Indiana	9	21	12	25	1,391	201	1	2
Illinois	33	20	21	25	2,310	953	4	14
Michigan	14	16	2	5	322	915	2	3
Wisconsin	1	1	30	25	2,934	355	1	3
West North Central States:								
Minnesota	7	3	1	1	340	778	0	1
Iowa [2]	11	6			368	76	3	0
Missouri	21	16	31		520	234	4	2
North Dakota	2				122	64	0	1
South Dakota	3	1			362	19	0	0
Nebraska	9	2			286	275	0	0
Kansas	8	9	2	1	641	282	0	2
South Atlantic States:								
Delaware	1				95	8	0	0
Maryland [2]	4	2	4	6	2,275	30	0	0
District of Columbia	2	1	1		75	19	0	0
Virginia [3, 4]	18	5			1,375	365	0	1
West Virginia	6	6	18	1	154	100	3	0
North Carolina	15	11	11	1	1,223	739	1	0
South Carolina	1	8	158	162	300	415	0	0
Georgia [4]	5	2			385	178	0	0
Florida [4]	3	4			320	19	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 19, 1934, and May 20, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933
East South Central States								
Kentucky	4	3	8	6	3[illegible]9	35	0	0
Tennessee	3	4	54	21	220	86	5	2
Alabama [4]	3	8	29	4	834	74	1	0
Mississippi	4	6					1	0
West South Central States								
Arkansas	5	1	6		54	227	1	0
Louisiana [4]	14	5	6	5	205	42	0	0
Oklahoma [5]	6	1	26	10	175	223	1	3
Texas [4]	39	40	115	92	530	1,088	0	1
Mountain States								
Montana [3]	2	2	6	3	97	56	1	0
Idaho [3]	1			2	34	16	0	0
Wyoming [3]	1				91	15	0	0
Colorado [3]	6	2		27	590	3	0	0
New Mexico	2	3		2	164	8	0	0
Arizona	1		2	3	17	135	0	0
Utah [2]	2	1			83	17	0	0
Pacific States								
Washington	4	10			132	84	1	1
Oregon [3]		3	24	46	75	55	0	0
California [4]	34	37	26	28	746	1,221	0	2
Total	463	452	638	530	29,434	15,653	44	47

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933
New England States								
Maine	0	0	13	11	0	0	4	3
New Hampshire	0	0	15	22	0	0	0	0
Vermont	0	0	11	10	0	0	3	0
Massachusetts	0	0	261	363	0	0	3	5
Rhode Island	0	0	18	28	0	0	0	0
Connecticut	0	0	59	112	0	0	1	3
Middle Atlantic States:								
New York	0	1	791	653	0	1	7	6
New Jersey	0	0	186	208	0	0	2	1
Pennsylvania	1	0	617	728	0	0	4	8
East North Central States								
Ohio	0	2	478	421	0	2	5	8
Indiana	0	1	92	71	1	0	6	5
Illinois	0	1	544	435	1	5	5	12
Michigan	1	0	804	456	1	0	2	2
Wisconsin	0	0	741	111	21	6	1	2
West North Central States								
Minnesota	0	0	65	101	7	0	2	3
Iowa [2]	1	0	56	25	9	16	1	1
Missouri	0	0	55	56	16	0	17	5
North Dakota	0	0	58	5	2	0	0	1
South Dakota	0	0	13	5	1	0	0	0
Nebraska	0	0	26	25	9	0	0	0
Kansas	0	1	35	31	4	1	2	5
South Atlantic States								
Delaware	0	1	3	15	0	0	0	0
Maryland [2]	0	0	50	95	0	0	10	2
District of Columbia	0	0	17	8	0	0	2	0
Virginia [3] [4]	0	1	25	35	0	0	5	5
West Virginia	0	0	93	7	2	0	3	4
North Carolina	0	2	17	39	0	1	1	9
South Carolina	0	0	2	0	0	2	16	14
Georgia [4]	0	0	4	9	0	0	20	11
Florida [4]	0	0		2	0	0	3	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 19, 1934, and May 20, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933	Week ended May 19, 1934	Week ended May 20, 1933
East South Central States								
Kentucky	0	0	31	6	0	0	5	2
Tennessee	0	1	15	60	0	0	4	4
Alabama [4]	0	1	9	10	0	0	6	2
Mississippi	0	0		4	0	1	5	6
West South Central States								
Arkansas	1	0	3	2	8	3	1	0
Louisiana [4]	0	1	10	8	1	1	19	6
Oklahoma [5]	0	0	2	10	4	2	1	1
Texas [4]	1	0	38	57	47	28	8	25
Mountain States								
Montana [3]	0	0	3	3	2	1	0	1
Idaho [3]	2	0	1	1	1	12	0	1
Wyoming [3]	0	1	17	3	0	1	1	0
Colorado [3]	0	0	23	32	1	4	0	0
New Mexico	0	0	14	5	0	0	2	3
Arizona	2	0	7	8	0	1	0	1
Utah [2]	0	0	7	6	1	0	0	0
Pacific States								
Washington	1	0	56	50	0	8	3	2
Oregon [3]	0	0	32	20	0	11	4	1
California [4]	36	4	180	146	1	25	18	8
Total	46	18	5,597	4,518	140	132	202	179

[1] New York City only

[2] Week ended earlier than Saturday

[3] Rocky Mountain spotted fever, week ended May 19, 1934, 29 cases, as follows Virginia, 4, Montana, 5, Idaho, 5, Wyoming, 6, Colorado, 3, Oregon, 6

[4] Typhus fever, week ended May 19, 1934, 21 cases, as follows: Virginia, 1, Georgia, 7, Florida, 2, Alabama, 2; Louisiana, 1, Texas, 7, California, 1

[5] Exclusive of Oklahoma City and Tulsa

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April 1934										
Alabama	4	58	200	125	3,284	30	0	28	2	19
Illinois	42	138	73	20	8,024		5	2,426	21	18
Maryland		24	50		8,459	1	0	294	0	19
Michigan	3	56	7	7	896		2	3,355	4	8
Minnesota	3	40	2		1,360		1	286	35	5
Montana	1	6	855		291		2	49	4	2
New Mexico	2	19	43	11	591	1	1	58	1	12
Ohio	15	102	173	2	5,615		2	3,640	2	16
Rhode Island			2		40		0	69	0	0
South Carolina		55	1,748	600	2,618	131	2	30	4	16
South Dakota	2	15			1,697		2	37	27	1
Virginia	10	64	294	2	5,713	12	0	112	1	17
West Virginia	11	61	106		477		1	333	1	19

April 1934	Cases
Actinomycosis:	
South Dakota	1
Anthrax:	
South Dakota	1
Chicken pox:	
Alabama	196
Illinois	2,068
Maryland	347
Michigan	1,454
Minnesota	596
Montana	156
New Mexico	64
Ohio	1,794
Rhode Island	132
South Carolina	172
South Dakota	54
Virginia	341
West Virginia	145
Conjunctivitis	
New Mexico	1
Diarrhea	
South Carolina	290
Diarrhea and dysentery	
Virginia	63
Diarrhea and enteritis	
Ohio (under 2 years)	8
Dysentery	
Alabama (amoebic)	2
Illinois (amoebic)	34
Illinois (amoebic carriers)	125
Illinois (bacillary)	4
Illinois (bacillary carriers)	1
Maryland	5
Michigan	10
Minnesota (amoebic)	7
Minnesota (bacillary)	1
Ohio	3
Virginia (amoebic)	1
Food poisoning	
New Mexico	1
Ohio	11
German measles	
Alabama	433
Illinois	903
Maryland	192
Michigan	355
Montana	7
New Mexico	209
Ohio	1,681
Rhode Island	1
South Carolina	1
Hookworm disease	
South Carolina	81
Impetigo contagiosa:	
Maryland	7
Montana	11

	Cases
Jaundice, epidemic:	
Minnesota	24
Lead poisoning	
Illinois	5
Ohio	11
Lethargic encephalitis	
Alabama	5
Illinois	3
Michigan	5
Minnesota	1
Ohio	2
South Carolina	3
Virginia	5
Mumps	
Alabama	159
Illinois	2,448
Maryland	204
Michigan	878
Montana	37
New Mexico	42
Ohio	436
Rhode Island	3
South Carolina	415
South Dakota	95
Virginia	208
West Virginia	14
Ophthalmia neonatorum	
Alabama	1
Illinois	2
Ohio	72
South Carolina	15
Virginia	1
Paratyphoid fever	
Michigan	1
Puerperal septicemia	
Illinois	3
New Mexico	3
Ohio	4
Rabies in animals	
Alabama	100
Illinois	29
Maryland	2
South Carolina	39
Rocky Mountain spotted fever	
Montana	29
South Dakota	1
Scabies	
Maryland	1
Montana	10
Septic sore throat.	
Illinois	31
Maryland	9
Michigan	58
Minnesota	1
Montana	5
New Mexico	4
Ohio	245
South Dakota	3
Virginia	39

	Cases
Tetanus:	
Alabama	1
Illinois	5
Ohio	4
Tick paralysis	
Montana	1
Trachoma	
Illinois	3
Maryland	1
Montana	3
Ohio	6
Trichinosis	
Illinois	1
Maryland	1
Ohio	2
Tularaemia	
Alabama	3
Michigan	8
Minnesota	2
Montana	1
Ohio	2
South Carolina	3
West Virginia	1
Typhus fever	
Alabama	7
Maryland	1
Undulant fever	
Illinois	8
Maryland	7
Michigan	5
Minnesota	10
Montana	2
Ohio	3
Rhode Island	1
South Carolina	1
South Dakota	1
Virginia	2
Vincent's infection	
Illinois	177
Maryland	5
Michigan	27
Montana	1
Whooping cough.	
Alabama	388
Illinois	1,957
Maryland	811
Michigan	1,356
Minnesota	296
Montana	80
New Mexico	176
Ohio	2,549
Rhode Island	141
South Carolina	659
South Dakota	75
Virginia	333
West Virginia	575

PLAGUE-INFETED GROUND SQUIRRELS IN KERN AND TULARE COUNTIES, CALIF.

The Director of Public Health of the State of California has reported that from May 11 to May 18, 1934, inclusive, 8 lots of ground squirrels, including 39 animals, from Kern and Tulare Counties, in the interior of California, were found to be plague-infected.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 12, 1934

This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths all causes
		Cases	Deaths								
Maine											
Portland	0		0	0	2	3	0	1	1	10	21
New Hampshire											
Concord	0		0	9	1	2	0	0	0	0	9
Nashua	0			38		5	0		0	0	
Vermont											
Barre	0		0	0	0	0	0	1	2	0	4
Burlington	0		0	1	0	1	0	0	0	5	7
Massachusetts											
Boston	3		0	195	23	48	0	14	1	67	235
Fall River	1		0	0	1	2	0	3	0	6	27
Springfield	0		0	2	0	2	0	1	0	1	30
Worcester	0		0	0	9	10	0	4	0	17	50
Rhode Island											
Pawtucket	0		0	0	0	2	0	0	0	0	17
Providence	0		0	8	4	10	0	1	0	22	50
Connecticut											
Bridgeport	0		1	1	3	21	0	1	0	1	47
Hartford	0		0	1	2	15	0	1	0	1	40
New Haven	0		1	1	2	1	0	0	0	9	44
New York											
Buffalo	1		0	124	21	22	0	6	0	19	154
New York	31	9	8	322	154	356	0	94	4	130	1,572
Rochester	4		0	1	5	60	0	5	0	7	65
Syracuse	0		0	55	5	3	0	1	0	79	64
New Jersey											
Camden	1		0	36	7	10	0	3	0	4	36
Newark	0	5	0	32	8	19	0	6	0	47	111
Trenton	0		0	55	1	14	0	4	0	3	28
Pennsylvania											
Philadelphia	5	2	0	431	53	120	0	25	0	46	510
Pittsburgh	6	2	2	333	23	34	0	7	0	29	152
Reading	1		0	6	0	6	0	0	0	6	15
Scranton	0			4		3	0		0	4	
Ohio											
Cincinnati	4		4	5	16	38	0	10	0	6	149
Cleveland	5	16	0	209	26	151	0	14	1	94	214
Columbus	1	2	2	12	5	40	0	10	0	29	96
Toledo	0	1	1	129	9	40	0	1	0	98	70
Indiana											
Fort Wayne	6		0	39	5	15	0	5	0	3	38
Indianapolis	0		1	446	0	19	0	3	1	40	
South Bend	0		0	14	1	4	0	0	0	0	13
Terre Haute	1		0	0	0	1	0	0	0	0	17
Illinois											
Chicago	9	1	2	751	50	278	0	38	1	181	656
Cicero											4
Springfield	0	2	0	41	7	3	0	2	0	28	29
Michigan											
Detroit	4	2	1	121	41	138	0	27	1	144	346
Flint	0		0	18	8	76	0	1	0	16	42
Grand Rapids	0		0	10	3	17	0	1	0	1	45
Wisconsin											
Kenosha	0			3		10	0		0	2	13
Milwaukee	0	1	1	78	5	124	0	2	0	72	98
Racine	0		0	2	0	11	0	0	0	2	14
Superior	0		0	3	0	0	0	0	0	0	9
Minnesota											
Duluth	0		0	0	0	2	0	0	0	1	11
Minneapolis	7		0	10	5	24	0	1	0	29	83
St. Paul	0		0	3	10	16	0	1	0	21	74
Iowa.											
Davenport	0			30		3	0		0	1	
Des Moines	0			0		18	1		0	0	27
Sioux City	4			154		0	0		0	1	
Waterloo	0			0		1	0		0	1	
Missouri											
Kansas City	4		0	4	20	28	0	9	0	15	107
St. Joseph	3		0	1	4	1	0	2	0	0	53
St. Louis	24	2	0	29	17	20	1	12	2	66	237

City reports for week ended May 12, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Dakota											
Fargo	0	------	0	12	1	2	0	0	0	9	1
Grand Forks	0	------	------	1	------	1	0	------	0	1	------
South Dakota											
Aberdeen	0	------	------	133	------	0	0	------	0	18	------
Sioux Falls	0	------	------	3	------	0	0	------	0	0	8
Nebraska											
Omaha	4	------	0	133	7	12	9	3	3	7	62
Kansas											
Topeka	0	------	0	26	1	0	0	0	0	44	6
Wichita	0	------	0	74	3	1	0	0	1	37	21
Delaware											
Wilmington	0	------	0	38	7	2	0	2	1	1	33
Maryland											
Baltimore	3	3	0	2,045	32	21	0	14	13	108	229
Cumberland	0	------	0	6	2	2	0	0	0	0	10
Ferderick	------	------	------	------	------	------	------	------	------	------	------
District of Columbia											
Washington	11	------	0	94	15	10	0	7	1	25	156
Virginia											
Lynchburg	1	------	0	120	1	1	0	0	0	15	13
Richmond	0	------	0	262	4	2	0	3	0	1	36
Roanoke	1	------	0	9	1	1	0	0	0	4	15
West Virginia											
Charleston	1	1	0	20	2	1	0	0	0	0	16
Huntington	3	------	------	0	------	12	0	------	0	0	------
Wheeling	1	------	0	10	3	32	0	0	0	7	14
North Carolina											
Raleigh	0	------	0	13	0	0	0	1	0	18	15
Wilmington	0	------	0	1	2	0	0	2	0	11	16
Winston-Salem	0	------	0	0	0	0	0	0	0	12	11
South Carolina											
Charleston	0	5	0	27	2	0	0	0	0	1	19
Columbia	0	------	0	0	2	0	0	0	0	0	10
Greenville	0	------	0	1	1	0	0	0	0	4	12
Georgia											
Atlanta	1	1	0	29	10	4	0	8	0	3	89
Brunswick	0	------	0	21	0	0	0	0	0	0	3
Savannah	0	19	0	78	3	0	0	0	0	1	31
Florida											
Miami	0	2	0	210	0	0	0	3	0	1	32
Tampa	3	------	0	166	0	0	0	2	1	0	23
Kentucky											
Ashland	0	------	------	55	------	0	0	------	0	5	------
Lexington	0	------	0	75	1	4	0	2	0	15	21
Louisville	4	1	0	84	5	17	0	1	0	38	81
Tennessee											
Memphis	1	------	1	38	10	2	0	5	0	14	76
Nashville	1	------	1	9	4	2	0	2	1	13	------
Alabama:											
Birmingham	1	------	1	37	5	0	0	3	0	0	69
Mobile	0	------	0	0	2	2	0	1	0	0	23
Montgomery	1	------	------	64	------	0	0	------	0	2	------
Arkansas											
Fort Smith	0	------	------	0	------	2	0	------	0	1	------
Little Rock	0	------	0	4	3	0	0	3	0	1	6
Louisiana											
New Orleans	19	3	3	47	17	15	1	11	2	2	147
Shreveport	0	------	0	3	2	0	0	1	0	2	31
Oklahoma:											
Tulsa	0	------	------	4	------	0	0	------	0	2	------
Texas											
Dallas	1	1	1	------	0	3	2	1	0	29	68
Fort Worth	0	------	1	1	2	2	0	1	1	7	34
Galveston	1	------	0	0	0	1	1	2	0	0	11
Houston	3	------	0	8	10	3	3	6	0	0	76
San Antonio	1	------	4	13	10	1	0	9	0	0	86
Montana											
Billings	0	------	0	0	0	0	0	0	0	5	5
Great Falls	0	------	0	10	1	0	0	0	0	1	10
Helena	0	------	0	0	0	2	0	0	0	6	2
Missoula	0	------	0	0	1	0	0	0	0	0	9
Idaho:											8
Boise	0	------	0	4	1	0	1	0	0	32	8
Colorado:											
Denver	7	29	0	635	8	12	0	2	0	79	57
Pueblo	0	------	0	33	0	1	0	0	0	15	6

City reports for week ended May 12, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
New Mexico											
Albuquerque	0	------	0	45	2	0	0	6	0	8	21
Utah											
Salt Lake City	0	------	0	21	5	8	4	2	0	91	34
Nevada											
Reno	0	------	0	1	1	0	0	0	0	0	4
Washington											
Seattle	0	------	0	6	1	30	0	8	0	67	79
Spokane	0	1	1	11	0	2	0	0	0	22	22
Tacoma	1	------	0	40	3	2	0	2	0	0	28
Oregon											
Portland	0	------	0	11	1	24	1	4	0	11	74
Salem	0	1	------	0	------	1	0	------	0	3	------
California											
Los Angeles	18	14	1	39	9	35	0	27	2	65	300
Sacramento	1	------	0	9	0	4	0	6	0	10	23
San Francisco	1	------	0	343	4	19	0	10	0	17	145

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts			
Boston	1	0	0
New York.			
New York	2	1	2
Ohio			
Cincinnati	0	1	0
Illinois			
Chicago	5	3	0
Michigan			
Detroit	1	0	0
Grand Rapids	1	1	0
Iowa			
Davenport	0	0	1
Sioux City	1	------	0
Missouri.			
St. Joseph	2	1	0
Missouri—Continued.			
St Louis	1	1	0
North Dakota			
Grand Forks	[1] 1	1	0
Tennessee			
Memphis	1	0	0
Alabama			
Birmingham	1	1	0
Louisiana			
New Orleans	2	1	0
Washington.			
Seattle	0	1	0
California			
Los Angeles	1	0	7
Sacramento	0	0	1
San Francisco	1	0	0

[1] Imported

Lethargic encephalitis.—Cases Boston, 1; New York, 5, Detroit, 2, St Louis, 1, Baltimore, 1

Pellagra.—Cases Atlanta, 1, Savannah, 1, Miami, 2, Tampa, 1, Montgomery, 1; New Orleans, 1, Dallas, 1, Los Angeles, 1, San Francisco, 1

Typhus fever.—Savannah, 1 case.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended May 5, 1934.—During the 2 weeks ended May 5, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis	1	1		2		1	2			7
Chicken pox		12	1	141	282	60	47	3	84	630
Diphtheria		3		43	11	6	3			66
Dysentery				1	2					3
Erysipelas				10	6	3	1		2	22
Influenza		95		2	40	9	2		9	157
Lethargic encephalitis				1	1					2
Measles	1	28		647	119	1,218	125	2	11	2,151
Mumps		3			309	16	14		84	516
Pneumonia		9			27		11		15	62
Poliomyelitis				2						2
Scarlet fever	1	30	4	125	300	47	5	4	158	674
Trachoma						2	1	2	1	6
Tuberculosis	4	4	21	110	105	5	21	5	31	306
Typhoid fever			3	41	15	4	8	1	1	73
Undulant fever				1	5				1	7
Whooping cough		7		211	545	36	17	5	37	853

NOTE.—No report was received from Alberta for the week ended May 5, 1934.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for May 25, 1934, pp. 636–648. A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued June 29, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month.)

Cholera

Indo-China—Pnom-Penh.—For the week ended May 12, 1934, 1 case of cholera was reported in Pnom-Penh, Indo-China.

Philippine Islands.—No cholera was reported in the Philippine Islands for the week ended May 19, 1934.

Plague

Argentina—Santiago de Estero Province.—A report dated May 17, 1934, states that 15 deaths from bubonic plague had been reported to that date in Santiago de Estero Province in the interior of Argentina. Health authorities were placing a sanitary cordon around the area.

United States—California.—A report of plague-infected ground squirrels in Kern and Tulare Counties, in the interior of California, appears on page 671 of this issue of the Public Health Reports.

X

UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES
PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 23

JUNE 8 - - - - - 1934

IN THIS ISSUE

Summary of Current Prevalence of Communicable Diseases
A Study of Silicosis Among Vermont Granite Quarriers
Court Upholds U.S. Public Health Service Milk Ordinance
Deaths in Large Cities During Week Ended May 19, 1934
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D C. - - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C. WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law. United States Code, title 42, sections 7, 30, 93; title 44, section 220

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health

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CONTENTS

	Page
Current prevalence of communicable diseases in the United States—April 22–May 19, 1934	677
Silicosis among granite quarriers	679
Court decision on public health	684
Deaths during week ended May 19, 1934	
Deaths and death rates for a group of large cities in the United States	687
Death claims reported by insurance companies	687

PREVALENCE OF DISEASE

United States	
Current weekly State reports	
Reports for weeks ended May 26, 1934, and May 27, 1933	688
Summary of monthly reports from States	690
Plague-infected ground squirrels in Kern County, Calif	691
Weekly reports from cities	
City reports for week ended May 19, 1934	692
Foreign and insular	
Puerto Rico—Notifiable diseases—4 weeks ended May 19, 1934	695
Cholera, plague, smallpox, typhus fever, and yellow fever—	
Cholera	695
Plague	695
Yellow fever	695

PUBLIC HEALTH REPORTS

VOL. 49 JUNE 8, 1934 NO. 23

CURRENT PREVALENCE OF COMMUNICABLE DISEASES IN THE UNITED STATES[1]

April 22–May 19, 1934

The prevalence of certain important communicable diseases, as indicated by weekly telegraphic reports from State health departments to the United States Public Health Service, is summarized in this report. The underlying statistical data are published weekly in the Public Health Reports, under the section entitled "Prevalence of Disease"

Measles.—The measles incidence still maintained the highest level in recent years. For the 4-week period ended May 19 the number of cases reported was 124,923, which was 1 8 times the number reported for the corresponding period last year and 1 5 times that for the same period in the years 1932 and 1931. Each geographic area continued to report an excess over last year. In the East North Central section the number of cases (31,892) was 2.6 times that for the same period last year, and in the South Atlantic the number (29,684) was 4.3 times last year's figure. Increases in other areas ranged from 15 percent in the New England and Middle Atlantic to 70 percent in the West North Central States.

Poliomyelitis—The number of cases of poliomyelitis rose from 91 for the preceding 4-week period to 146 for the current period. The incidence was the highest for this period in recent years. In 1933, 1932, and 1931, the numbers of cases for this period were 76, 71, and 87, respectively. States in the Mountain and Pacific areas were largely responsible for the current high incidence. In the Mountain group, Idaho reported 6 cases and Arizona 15, as against none last year, and California, in the Pacific area, reported 80 as against 6 last year. The East North Central and South Atlantic areas reported very appreciable decreases from last year's figures; other areas closely approximated last year's incidence.

Meningococcus meningitis.—For the country as a whole the incidence of meningococcus meningitis continued to be the lowest in

[1] From the Office of Statistical Investigations, U S. Public Health Service. The numbers of States included for the various diseases are as follows. Typhoid fever, 48, poliomyelitis, 48, meningococcus meningitis, 48, smallpox, 48; measles, 47; diphtheria, 48, scarlet fever, 48, influenza, 43 States and New York City. The District of Columbia is counted as a State in these reports. These summaries include only the 8 important communicable diseases for which the Public Health Service receives regular weekly reports from the State health officers.

recent years. For the 4 weeks ended May 19 there were 220 cases reported, as compared with 230, 277, and 573 for the corresponding period in the years 1933, 1932, and 1931, respectively. A comparison of geographic areas shows that the current incidence closely approximated that of last year in all areas except the East North Central and East South Central In the former area the number of cases (59) was only 65 percent of last year's figure and in the latter section the number (26) was almost double that of last year.

Typhoid fever.—The reported incidence of typhoid fever (843 cases) was the highest for this period in 5 years States that were mostly responsible for the rather high incidence are in widely scattered geographic areas. Vermont, in the New England area, reported 57 cases as against none last year The outbreak was reported as a water-borne epidemic from a broken sewer, but the specific locality was not stated Missouri, in the West North Central area, reported 29 cases as against 10 last year; Louisiana, in the West South Central section, reported 71 as against 45; and the three States in the Pacific area reported 60 as against 35 last year. In other areas the incidence followed the level of recent years very closely.

Smallpox.—The number of cases (645) of smallpox reported for the 4 weeks ended May 19 approached very closely that for the corresponding period last year (676) cases, but it was considerably below the incidence in the preceding years For this period in 1932, 1931, and 1930 the numbers of cases were 1,217, 3,423, and 5,512, respectively. The disease was most prevalent in the East and West North Central areas. Of the 139 cases reported from the East North Central area, Wisconsin reported 112 as compared with 12 last year; while in the West North Central area each State except Iowa contributed to the increase. Other areas compared very favorably with recent years.

Diphtheria.—The total number of cases of diphtheria reported for the 4 weeks ended May 19 was 2,190, as compared with 2,033, 2,903, and 3,475 for the corresponding period in the years 1933, 1932, and 1931, respectively. For the current period the New England States reported a 50 percent decrease from last year's figure, the West North Central group reported a 50 percent increase, and in other areas the current incidence was approximately the same as that last year.

Scarlet fever—The incidence of scarlet fever continued to decline. For the 4 weeks ended May 19 the number of cases totaled 22,449, which figure compared very favorably with the average for recent years. The New England, Middle Atlantic, South Atlantic, and East South Central areas reported decreases from last year's figure, while the East North Central, West North Central, West South Central, and Mountain and Pacific areas reported slight increases.

Influenza.—The number of cases of influenza dropped about 50 percent during the current 4-week period from that reported during the preceding period The number of cases (3,918) was, however, about 30 percent in excess of that reported for the corresponding period last year. For this period in the years 1932, 1931, and 1930 there were reported 7,076, 3,980, and 3,224 cases, respectively. With one exception, the West North Central, all geographic areas reported a very favorable influenza situation In the West North Central section, Missouri, where the disease has been unusually prevalent for several preceding periods, reported 224 of the 258 cases reported for that area. Other States in that area reported only a normal incidence.

Mortality, all causes.—The average mortality in large cities reporting to the Bureau of the Census for the 4 weeks ended May 19 was 11.8 per thousand population, annual basis, as compared with 11.0 for the corresponding period last year. For this period in 1932 and 1931 the rates were 11 6 and 11.9, respectively.

SILICOSIS AMONG GRANITE QUARRIERS

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It is the common belief that granite quarrying is not so dangerous an industry as granite cutting in enclosed sheds, since quarry work is conducted outdoors and hence may not be attended with very much dust exposure. It has been known, however, that certain quarry operations require the use of pneumatic tools which are associated with the formation of considerable amounts of dust. Since mortality statistics by specific occupations for quarriers were not available, it was thought that a study of the physical condition of workers employed in a typical granite quarry might cast some light on this problem. The present report deals with such a study made in a representative granite quarry in Vermont. In addition to a clinico-radiographic investigation, the dust exposure for the various occupations was determined.

NATURE OF GRANITE-QUARRY DUST

The mineralogical composition of the dust to which granite quarriers are exposed may be considered as similar to that given for granite cutters in a previous publication (1). Suffice it to say at this time that the quartz content of this dust is 35.2 percent. A study of the size of the dust particles to which quarry workers are exposed (2) showed that 75 percent of the particles were less than 2 microns in average diameter with only 10 percent of the dust less than 1 micron. The median size of the dust was found to be 1.5 microns, and no dust

particles larger than 6 microns were disclosed by these measurements. It is apparent, therefore, that the dust is of a potentially dangerous size and of a toxic nature.

DESCRIPTION OF GRANITE QUARRYING AND OCCUPATIONAL CLASSIFICATION

A representative granite quarry, employing about 150 men, was selected for study. Table 1 presents a classification of the various occupations involved in quarrying, as well as the number of workers employed and examined in each occupation. The drillers are the only workers using pneumatic tools, devices known to produce considerable quantities of dust. These drillers constitute 38 percent of the quarry personnel.

TABLE 1.—*Classification of quarry occupations and number of workers employed and examined in each occupation*

Occupation	Number in quarry so employed	Number examined	Occupation	Number in quarry so employed	Number examined
Drillers			Other quarry employees—Continued		
Leyner	17	13	Derrick-men	21	10
Plug and jack-hammer	37	24	Muckers	24	4
Other quarry employees			Blacksmiths	6	2
Superintendent	1	1	Tool boys	2	
Foremen	7	3	Water boy	1	
Compressor engineer	1		Machinists	3	
Hoisting engineers	12	5	Air line repairer	1	
Locomotive engineer	1		Pipe fitters	2	1
Locomotive fireman	1				
Steam shovel man	1				
Crane operator	1		Total	142	63

Briefly, granite is quarried in the following manner: Channeling machines (Leyner drills) are used to drill a series of holes in the rock to be quarried. When a sufficient number of holes of the required depth have been cut, a groove about 1 inch in width is made by means of a broaching bar, which breaks the slender section of stone between the successive holes. As soon as the floor of the quarry has been lined with parallel grooves of the required depth, the channelers are run across at right angles to divide the granite into blocks. These blocks are then broken off at the bottom by drilling and wedging. The stone thus obtained is split to size either in the quarry hole or at the top of the quarry yard by drilling holes in the blocks with plug drills and driving in the necessary number of wedges to cause them to split. At times it is necessary to use jack-hammer drills for this purpose; however, this type of drill is employed only in the quarry hole by the same men who operate plug drills, so that actually there are only two kinds of drillers in a granite quarry, those who operate Leyner drills and those who use plug and jack-hammer drills. The

blocks of granite which have been prepared for removal are lifted out of the quarry by derricks. The other occupations listed in table 1 are explained by their designation.

OCCUPATIONAL DUST EXPOSURE

To determine the dust exposure associated with the various quarry occupations, 20 atmospheric dust samples were obtained with the impinger apparatus (3) The results of the dust determinations are summarized in table 2. It is apparent from these results that Leyner drillers and plug and jack-hammer drillers working in the quarry hole are exposed to high dust concentrations (144.4 and 112.1 million particles per cubic foot, respectively). Plug drillers in the yard are exposed to 36.9 million particles, whereas all other workers were found to be subjected to only 5 8 million particles of dust per cubic foot of air.

TABLE 2.—*Occupational dust exposure of granite quarriers*

Occupation	Number of workers	Dust counts in millions of particles per cubic foot of air		
		Average [1]	Minimum	Maximum
Leyner drillers	17	144 4	5 3	1,085 0
Plug and jack-hammer drillers (quarry hole)	37	112 1	4.1	396 8
Plug drillers (yard)		36 9	5 3	58 0
All other workers	88	5 8	4.1	10 7

[1] Weighted average For method of obtaining this average see reference 4

In the study of the health of granite cutters (1) it was concluded that those workers exposed to less than 10 million particles of dust per cubic foot did not develop a disabling silicosis, even after many years of work. It is apparent from the results of our present dust study on granite quarriers that 38 percent of the men employed are exposed to quantities of granite dust which would be expected to lead to definite lung injury.

CLINICO-RADIOGRAPHIC FINDINGS

Sixty-three quarrymen presented themselves voluntarily for examination after being approached through their local trade union. Of this number, 25 (40 percent) were French-Canadian; 19 (30 percent) old American; 12 (19 percent) Canadian, and 7 were Scotch, English, Italian, Finnish, and Spanish. The majority of the men were employed at the quarry where the dust determinations were made, but a few of those examined were employed in nearby quarries. Forty (63 percent) of the men examined had worked less than 10 years as granite quarriers. All the workers were given careful and

complete physical examinations, including X-rays of the chest obtained with a standard hospital X-ray unit. Three of the men were excluded from the analysis because of previous exposure to highly siliceous dust. The final diagnoses on the remaining 60 men are summarized in table 3

TABLE 3 —*Clinical findings in relation to years of exposure*

Occupation	Diagnosis	Years of exposure				
		Less than 5	5 to 9	10 to 19	20 and more	Total
Drillers	Essentially negative	13	8	4	1	26
	Silicosis		4	2	3	9
	Silico-tuberculosis				1	1
All others	Essentially negative	5	10	2	7	24
Total		18	22	8	12	60

The basis for these diagnoses was essentially the same as that in the study on granite cutters working in sheds (1). For the sake of comparison drillers were considered separately from all other quarry workers. It is quite evident that pathological changes due to dust are limited to drillers, the only persons creating dust Ten of the drillers showed signs of silicosis. Half of those with exposure of 5 to 19 years had silicosis, and 4 of the 5 men with more than 20 years of exposure showed this condition. If mortality statistics were available for quarry workers by specific occupations they might be expected to show as high a death rate from tuberculosis for quarry drillers as found among other pneumatic tool workers in granite-cutting sheds. In granite quarrying 38 percent of the workers (drillers) are exposed to dangerous concentrations of dust, while in granite-cutting sheds 74 percent of all the men are thus subjected. It is obvious that mortality statistics for the quarry industry as a whole (not by specific occupation) would tend to show a lower death rate from tuberculosis than would be found for granite cutters working in sheds.

DUST CONTROL

It seems quite logical that the only solution of the dust problem is the removal of the dust at its source. The present study shows that the only occupations in a granite quarry which are attended with a dangerous dust exposure are the various types of drilling operations. In a similar investigation made by one of the authors in another granite quarry, it was shown that the use of the wet method in Leyner drilling reduced the amount of dust at the worker's breathing level in one instance from 58 to 6 million particles per cubic foot of air. It is not always possible to resort to wet drilling methods,

and for this reason exhaust ventilation appears to be more promising as an effective means of reducing the dust exposure of drillers to a safe limit. Recent studies in the control of the silicosis hazard in the hard-rock industries (5, 6, 7) indicate a method for the effective removal of dust generated in the use of pneumatic rock drills. The device developed as a result of these studies is known as the "Kelley dust trap", with which it is possible to keep the dust at the worker's breathing level to an amount less than 5 million particles per cubic foot.

SUMMARY

The present report deals with a study of the effects of the inhalation of granite dust generated in granite quarrying. A clinicoradiographic study of 63 granite quarriers was made, in addition to determinations of the occupational dust exposure The dust determinations showed that 38 percent of the workers (drillers) were exposed to many times the amount of dust considered safe at the present time. The clinical findings disclosed that drillers were the only persons showing pathologic lung changes. Half of these workers with an exposure of 5 to 19 years had silicosis, and 4 of the 5 men with more than 20 years of such trade life showed this condition. This study suggests that quarry drillers may experience as high a death rate from pulmonary tuberculosis as do other pneumatic-tool workers in granite-cutting sheds. Methods for the elimination of dust in quarry operations are also presented.

ACKNOWLEDGMENTS

The authors desire to express their appreciation and gratitude to Surg. Albert E. Russell, under whose direction this study was conducted, for his counsel and guidance throughout the investigation.

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COURT DECISION ON PUBLIC HEALTH

United States Public Health Service milk ordinance held valid—(Reno County, Kans., District Court; *Billings et al.* v. *City of Hutchinson et al.*; decided May 1, 1934.) In 1933 the city of Hutchinson adopted the milk ordinance recommended for adoption by the United States Public Health Service. The enforcement of this ordinance was sought to be enjoined by the plaintiffs, who contended that the ordinance was invalid because (*a*) it was unreasonable, (*b*) it conflicted with State statutes, (*c*) the license fees provided were in excess of expenses, and (*d*) the milk inspector was clothed with arbitrary powers

Before taking up in detail the various points raised against the ordinance the district court adverted to certain principles that had been laid down by the Kansas Supreme Court, namely (*a*) that, as regarded reasonableness, the question was whether or not, considering the entire situation and all the circumstances, an action taken by a city commission so far failed to measure up to what was fair, just, and reasonable as to make it clear that the action was arbitrary, capricious, and oppressive; and (*b*) that all presumptions were in favor of the validity of an ordinance, the court not substituting its judgment for that of the city's governing body upon a question of policy and only denying effect to an ordinance where its unreasonableness was so manifest as to show bad faith or such arbitrary conduct as to amount to practically the same thing.

The court then proceeded to consider separately the objections made to the ordinance under attack and disposed of them adversely to the plaintiffs, as shown by the following, quoted from the opinion:

> The court can see nothing unreasonable in the requirement that an applicant be required to disclose the amount of milk distributed, the name of the producer or producers, and the amount purchased from each. Human nature being prone to evade regulation, licenses, taxes, etc, it might be advantageous to the city to know the amount of milk purchased in order to check against the amount distributed so that the opportunity of purchasing milk from an uninspected dairy would be reduced to a minimum The inspector should know how many vehicles are engaged in distribution so that he will know when he has completed his inspection, and an unexpected vehicle carrying uninspected milk might thus be prevented from distributing milk. Besides, answering a few questions more or less works no hardship on anyone. The route of shipment would also furnish a means of inspecting uninspected milk.

Nor does the court see anything unreasonable in requiring that dairies be inspected Milk is the one food that requires the greatest care in handling and the one food most susceptible to contamination While surgical cleanliness in the handling of milk and its products is perhaps impossible to attain at present, that condition most nearly approaching it is certainly most desirable from the consumers' viewpoint As the consumers far exceed the producers in numbers, their viewpoint should be entitled to some weight on the question of reasonableness There are dairies, fortunately a great many of them, whose natural pride in their product will compel them to keep their premises in a perfect state of sanitation, but there are others about which the less said perhaps the better The first class require no inspection yet welcome it; the others resent it. Unfortunately milk is milk in the public mind, and milk from a dirty dairy often looks and tastes the same as milk from a dairy where surgical cleanliness is maintained It is to protect the public from its own negligence or ignorance, with the consequent sickness and disease, that milk ordinances are adopted and enforced

There was considerable testimony in this case that a strict compliance with the requirements of the ordinance would entail considerable expense upon the milk producers. There was other evidence that, had the requirements of the prior milk ordinance been complied with, this one would entail little if any additional expense It is unfortunate that money must be spent in making improvements and by those least able to afford it, but a few lives saved or a few cases of typhoid avoided will far offset, so far as the public is concerned, the additional expense the dairymen are put to

It goes without saying that milk from a dark barn is apt to be dirtier than milk from a well-lighted barn, because the filth in the dark barn is not so easily seen nor can foreign objects, kittens for instance, be quite so readily detected falling into a milk pail Common sense tells me that a dark, ill-ventilated, crowded barn is going to be more productive of dirty milk than is a well-lighted, well-ventilated, uncrowded barn; hence the requirements as to space, windows, and ventilation are not unreasonable.

Is the requirement of a capping machine unreasonable? Bottles capped by hand are in many cases clean, but are they always so? Is there less likelihood of bacteria reaching the milk by using a machine than by using the thumb of a human hand? A thumb, inadvertently moistened by its owner's tongue, run through its owner's hair, wiped through the sweat of its owner's brow, may carry some germs regardless of how clean it may have been when the capping was commenced. There is considerable argument in favor of the machine and at any rate its requirement is not unreasonable within the definition of unreasonableness

The requirement that milk be cooled to a certain temperature within a very short time of its being milked is such a general requirement in milk ordinances and statutes that it hardly needs comment. Milk from a healthy cow is practically sterile; bacteria are carried into it largely by dirt. Warm milk is a fertile medium for their propagation. Chilling milk retards bacterial growth. Hence the sooner clean milk is chilled to a point below which bacteria will not grow, the less bacteria the milk should contain, other factors of cleanliness being equal.

Nor is it unreasonable to require that milk be transferred between containers under sanitary conditions Bacteria are air and dust borne; dirty surroundings would contaminate the air, which in turn would contaminate the milk. The requirement is reasonable.

Considerable emphasis is put upon the bacteria count requisite of the ordinance, partly because the State law requires another test—the "Babcock test"—and partly because it was not shown that milk of a high bacteria count was any less healthy than milk of a low bacteria count, and also because some bacteria are harmful to human beings and others are not—milk containing only 4,000 typhoid

bacteria per cubic centimeter for instance being less fit for human consumption than milk containing 100,000 or more bacteria per cubic centimeter of harmless bacteria.

The court understands from the evidence and argument of counsel that low bacteria count is not the ultimate end to be achieved The ordinance is designed to require that milk be produced under strictly sanitary conditions, and it is assumed, based on experience, that, if sanitary conditions do exist, milk will be sterile or nearly so. A high bacteria count then would be an indication that somewhere along the line conditions were not up to requirement. Both the conditions under which the milk is produced and the bacteria count must meet certain requirements before the milk can be sold, and it is graded in accordance with both Of course, typhoid bacteria, even in small quantities, will do more harm than harmless bacteria in large quantities. But if any bacteria be present in any quantity it is evidence that dirt is getting into the milk somewhere in the process, the more dirt the more bacteria, and the more bacteria the higher the harmful bacteria count will be as a rule Until a better test of cleanliness is devised, the bacteria count test must be used and is not in any way unreasonable

It might not be amiss to call attention to the fact that the Babcock test is used to determine butter-fat content of milk and has no connection whatever with the amount of dirt the milk contains

Is the classification into grades A, B, C, and D unreasonable?

Plaintiffs argue that there are but two kinds of milk, that fit for human consumption and that unfit for such use There are just as many different kinds of milk as there are cows and methods of production and handling. Milk ranges in degrees of cleanliness from that which is practically sterile to that which is absolutely filthy. The city has seen fit to classify milk according to method of production and handling Customers are afforded an opportunity to purchase milk of varying degrees of cleanliness, and such milk is labeled for their convenience in making their selection. This is no more unreasonable than the different qualities of canned goods, meats, eggs, and other food products; if one customer wants grade C milk, that is his privilege, but another customer who wants grade A milk should not be compelled to buy grade C milk, or worse, because there is no adequate inspection and classification. Again, it is the consumer who must be allowed a viewpoint as well as the producer. The ordinance does not prohibit the sale of grade C milk, nor fix a price. The producer can produce grade A milk if he wants to, or be satisfied in selling grade C. If grade A milk costs more to produce, then it will command a higher price and perhaps a more limited customer list than grades B and C. The ordinance is neither arbitrary nor unreasonable in establishing these classifications.

If there are other charges of unreasonableness they are not urged with sufficient degree of force to challenge the court's attention, and a very careful reading of the ordinance, perusal of the evidence and briefs discloses nothing that this court can hold unreasonable, as unreasonableness has been defined in Kansas.

Plaintiffs cite but a few instances in their brief of conflicts between the ordinance and the State statute, section 65–701 et seq., 1933 Supp., R.S. 1923.

The argument seems to be based chiefly on the proposition that, the State having enacted a statute covering the general subject of milk and milk products production and sale, no city can by ordinance regulate such products, or, if they do attempt such regulation, it must be in literal compliance with the State law. With this proposition this court cannot agree.

A reading of the statute and ordinance demonstrates that many details were omitted from the statute that have been covered by the ordinance, the ordinance being stricter than the statute in many particulars, but is not inconsistent or repugnant to the statute in any respect. A few of the differences are as follows:

Milk is required by statute to have 3¼ percent butterfat, and to this requirement the ordinance adds the additional requirement of 8½ percent solids not fat. Cream is required by statute to have not less than 18 percent of butterfat The ordinance adds to this requirement that the acidity shall not exceed 0 20 percent expressed as lactic acid The statute provides for a "Babcock test" The ordinance adds bacterial count as an additional test The statute does not grade milk while the ordinance does The ordinance goes into detail regarding sanitary requirements while the statute is more general Can it be said that an ordinance that imposes greater requirements in handling and sale of foodstuffs—is more strict than a statute—is void because it conflicts with that statute?

Our supreme court in the case of *Kansas City* v *Henre*, 96 Kan 794, has answered this question in the negative, although in that case it was rules of the State board of health that were enlarged upon by the ordinance The principle is exactly the same Before an ordinance can be held void in Kansas because it covers the same subject matter as a State statute it must be repugnant to that statute Repugnant means making opposition, objecting, averse, contradictory, inconsistent The ordinance in question cannot be said to come within this definition of repugnancy

The court has no evidence before it whether or not the license fees will exceed the expense of operating the milk inspection department, and, the burden being upon plaintiffs to establish this fact, the presumption is that the ordinance was enacted and the fees established so that the fees and expenses would approximately equal each other.

The milk inspector is clothed with power An inspector without power would be useless True, he can revoke permits and do a great many other things under the ordinance An appeal is provided to the city commission from his decision. Plaintiffs argue that this renders the ordinance void Nowhere in the ordinance is the right of appeal to the courts taken from those aggrieved by the inspector's actions. He does not have arbitrary powers, because they are all subject to review, first by the commission and then by the courts Should he attempt to exercise arbitrary powers, that matter can easily be taken care of when the time arrives

The court held the ordinance valid and denied the injunction asked for.

DEATHS DURING WEEK ENDED MAY 19, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 19, 1934	Corresponding week, 1933
Data from 86 large cities of the United States.		
Total deaths	8,082	7,579
Deaths per 1,000 population, annual basis	11 3	10 6
Deaths under 1 year of age	620	497
Deaths under 1 year of age per 1,000 estimated live births	58	[1] 41
Deaths per 1,000 population, annual basis, first 20 weeks of year	12 4	11 8
Data from industrial insurance companies.		
Policies in force	67,789,577	68,086,402
Number of death claims	13,559	12,658
Death claims per 1,000 policies in force, annual rate	10 4	9 7
Death claims per 1,000 policies, first 20 weeks of year, annual rate	11 0	10.8

[1] Data for 81 cities

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended May 26, 1934, and May 27, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 26, 1934, and May 27, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933
New England States								
Maine	7	3		5	13	6	0	1
New Hampshire		1			93	100	0	1
Vermont		1			28	2	0	0
Massachusetts	7	20			1,116	736	1	2
Rhode Island	2	1				2	0	0
Connecticut		2	1	2	173	226	3	1
Middle Atlantic States:								
New York	49	80	[1] 19	[1] 9	1,027	2,597	2	6
New Jersey	12	26	21	2	703	1,419	2	8
Pennsylvania	58	34			3,725	1,348	7	8
East North Central States.								
Ohio	9	9	6	8		469	3	0
Indiana	12	16	26	17	1,067	272	2	4
Illinois	32	26	10	27	2,291	802	7	14
Michigan	8	26	4	1	375	930	3	2
Wisconsin	5	2	13	17	2,228	332	1	1
West North Central States.								
Minnesota	5	3	1	2	174	583	1	0
Iowa [2]	2	2	5		302	20	2	0
Missouri	21	20	11	1	540	305	5	3
North Dakota	6	3			131	113	1	0
South Dakota	5	2			214	17	2	0
Nebraska	5	3			185	171	0	1
Kansas	8	7	1	1	547	244	0	1
South Atlantic States.								
Delaware		2			136	15	0	0
Maryland [2 3]	7	7	9	5	1,895	63	0	0
District of Columbia	8		3		48	21	0	1
Virginia [3]	7	13			1,131	241	1	0
West Virginia	6	7	21	1	187	136	1	1
North Carolina [3]	12	8	10	21	1,332	600	1	0
South Carolina	6	9	117	130	217	214	0	0
Georgia [4]	5	10			206	156	1	2
Florida	1	5	1	1	266	18	0	1

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 26, 1934, and May 27, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933
East South Central States								
Kentucky	7	4	10	20	632	113	0	1
Tennessee [3]	7	-------	9	9	333	150	0	1
Alabama [4]	13	4	18	17	618	86	4	0
Mississippi [2]	12	2	-------	-------	-------	-------	1	0
West South Central States								
Arkansas	5	5	22	9	69	425	0	1
Louisiana	10	13	2	20	157	23	1	0
Oklahoma [5]	5	5	31	12	167	110	2	0
Texas [4]	39	43	85	56	479	684	4	0
Mountain States								
Montana [3]	3	-------	7	-------	107	50	0	0
Idaho [3]	-------	-------	3	-------	24	12	1	0
Wyoming [3]	-------	1	-------	-------	88	6	0	0
Colorado [3]	6	5	-------	23	809	7	2	0
New Mexico	4	9	1	-------	74	12	2	0
Arizona	-------	3	5	-------	11	103	0	1
Utah	-------	-------	-------	2	46	31	0	0
Pacific States								
Washington	4	8	-------	-------	-------	64	1	3
Oregon [3]	1	-------	27	20	39	57	0	0
California	25	31	21	22	1,119	1,255	0	2
Total	446	481	520	460	25,122	15,351	64	57

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933
New England States								
Maine	0	0	19	25	0	0	2	1
New Hampshire	0	0	8	14	0	0	0	0
Vermont	0	0	30	13	0	0	1	0
Massachusetts	2	4	237	406	0	0	0	4
Rhode Island	0	0	20	18	0	0	0	0
Connecticut	0	0	57	85	0	2	1	1
Middle Atlantic States								
New York	2	2	765	651	0	0	13	5
New Jersey	2	1	197	212	0	0	3	12
Pennsylvania	1	0	646	711	0	0	7	6
East North Central States								
Ohio	3	1	461	416	2	6	11	9
Indiana	1	0	98	92	1	1	5	17
Illinois	2	0	424	419	0	7	3	14
Michigan	0	1	635	356	1	0	1	1
Wisconsin	1	2	272	128	24	3	3	3
West North Central States								
Minnesota	1	0	72	80	7	1	4	1
Iowa [2]	0	0	41	24	1	54	0	3
Missouri	3	0	71	66	0	2	-------	10
North Dakota	0	0	27	6	0	3	1	1
South Dakota	0	1	-------	8	5	0	0	3
Nebraska	0	0	24	24	4	3	0	2
Kansas	0	0	33	31	4	2	1	0
South Atlantic States								
Delaware	0	0	7	15	0	0	2	2
Maryland [2 3]	0	0	56	106	0	0	9	8
District of Columbia	0	0	12	10	0	2	0	0
Virginia [3]	0	0	23	32	0	0	9	8
West Virginia	0	1	63	25	0	0	6	7
North Carolina [3]	1	0	17	35	0	2	2	12
South Carolina	0	0	1	2	1	2	15	21
Georgia [4]	0	0	2	1	1	1	26	16
Florida	0	1	-------	3	0	0	3	2

Footnote at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 26, 1934, and May 27, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933	Week ended May 26, 1934	Week ended May 27, 1933
East South Central States								
Kentucky	0	1	32	60	0	4	4	26
Tennessee [3]	0	0	20	17	0	0	3	4
Alabama [4]	1	0	5	5	0	0	8	12
Mississippi [2]	0	0	6	3	0	0	8	7
West South Central States								
Arkansas	0	0		1	2	0	2	8
Louisiana	0	0	8	7	0	1	12	21
Oklahoma [5]	1	0	5	7	4	22	5	9
Texas [4]	0	1	42	50	35	10	13	26
Mountain States								
Montana [3]	0	0	5	35	4	0	2	2
Idaho [3]	1	0	1	0	0	5	0	1
Wyoming [3]	0	0	1	9	5	0	0	0
Colorado [3]	0	0	21	28	4	0	3	1
New Mexico	0	0	11	7	0	0	5	1
Arizona	2	0	13	6	0	0	19	1
Utah	0	0	2	4	0	0	0	0
Pacific States								
Washington	0	1	73	44	0	2	1	1
Oregon [3]	2	1	32	22	2	19	3	1
California	92	2	174	150	2	34	16	2
	118	20	4,769	4,469	109	188	232	292

[1] New York City only
[2] Week ended earlier than Saturday
[3] Rocky Mountain spotted fever, week ended May 26, 1934, 22 cases, as follows Maryland, 2, Virginia, 1, North Carolina, 1; Tennessee, 1, Montana, 3, Idaho, 1, Wyoming, 10, Colorado, 1; Oregon, 2
[4] Typhus fever, week ended May 26, 1934, 16 cases, as follows Georgia, 4, Alabama, 4, Texas, 8
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1934										
South Dakota		25	26		2,520		0	87	26	2
Tennessee	18	51	681	66	6,487	9	2	144	16	19
April 1934										
Florida		36	4	24	3,132	7	2	14	2	14
Idaho	1	3	4		418		8	8	31	2
Kansas	2	28	19		2,121			206	24	9
Louisiana	2	76	40	66	1,438	7	0	83	16	57
Oklahoma [1]	7	21	218	26	1,405	8	1	61	18	17
Oregon		2	144		343	1	1	129	32	4
Tennessee	6	28	220	125	2,910	3	2	112	2	22
Texas	6	231	973	1,196	3,738	27	6	243	134	31
Washington	4	22	43	1	815		2	203	34	9
Wisconsin	3	10	157		7,781		4	899	131	6

[1] Exclusive of Oklahoma City and Tulsa.

March 1934

	Cases
Chicken pox	
South Dakota	76
Tennessee	250
Dysentery	
South Dakota (amoebic)	1
Tennessee	3
Tennessee (amoebic)	2
German measles	
Tennessee	318
Impetigo contagiosa	
South Dakota	8
Tennessee	1
Lethargic encephalitis	
Tennessee	5
Mumps	
South Dakota	154
Tennessee	537
Ophthalmia neonatorum	
Tennessee	2
Puerperal septicemia	
South Dakota	1
Scabies	
South Dakota	4
Septic sore throat	
South Dakota	2
Tennessee	15
Tetanus	
South Dakota	1
Trachoma	
South Dakota	36
Tennessee	51
Tularaemia	
Tennessee	1
Vincent's infection	
Tennessee	8
Whooping cough	
South Dakota	65
Tennessee	211

April 1934

	Cases
Actinomycosis:	
Kansas	1
Chicken pox	
Florida	238
Idaho	11
Kansas	453
Louisiana	73
Oklahoma [1]	60
Oregon	169
Tennessee	102
Washington	408
Wisconsin	1,361
Dysentery	
Florida	2
Kansas (amoebic)	1
Louisiana	3
Oregon	2
Tennessee	3
Washington (amoebic)	1
German measles	
Kansas	368
Tennessee	92
Washington	42
Wisconsin	2,131
Hookworm disease	
Louisiana	24
Impetigo contagiosa	
Kansas	1
Oregon	28
Tennessee	5
Jaundice, epidemic	
Oregon	3
Lethargic encephalitis	
Florida	1
Kansas	4
Louisiana	2
Oklahoma [1]	1
Oregon	2
Tennessee	1
Texas	1
Washington	2
Wisconsin	1
Mumps	
Florida	159
Idaho	15
Kansas	652
Louisiana	4
Oklahoma [1]	79
Oregon	43
Tennessee	329
Washington	685
Wisconsin	207
Ophthalmia neonatorum	
Kansas	1
Tennessee	2
Wisconsin	2
Paratyphoid fever	
Idaho	1
Louisiana	2
Oregon	1
Texas	1
Washington	3
Puerperal septicemia	
Tennessee	1
Rabies in animals	
Kansas	10
Louisiana	10
Washington	12

April 1934

	Cases
Rocky Mountain spotted fever	
Idaho	6
Oregon	14
Scabies	
Oklahoma [1]	5
Oregon	17
Tennessee	4
Washington	1
Septic sore throat	
Idaho	3
Louisiana	1
Oklahoma [1]	26
Oregon	2
Tennessee	7
Washington	1
Tetanus	
Kansas	2
Louisiana	3
Tennessee	3
Trachoma	
Louisiana	1
Oklahoma [1]	9
Tennessee	22
Wisconsin	4
Tularaemia	
Idaho	1
Louisiana	3
Tennessee	1
Wisconsin	1
Typhus fever	
Florida	1
Undulant fever	
Florida	2
Idaho	1
Louisiana	8
Oklahoma [1]	1
Washington	2
Wisconsin	4
Vincent's infection	
Kansas	7
Oklahoma [1]	1
Oregon	4
Tennessee	10
Washington	1
Whooping cough	
Florida	87
Idaho	30
Kansas	973
Louisiana	39
Oklahoma [1]	125
Oregon	156
Tennessee	226
Washington	814
Wisconsin	1,361

[1] Exclusive of Oklahoma City and Tulsa

PLAGUE-INFECTED GROUND SQUIRRELS IN KERN COUNTY, CALIF.

The director of public health of the State of California has reported that on May 19, 1934, three ground squirrels from Kern County, in the interior of California, were found to be plague infected.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 19, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	1	------	0	0	2	6	0	1	3	14	22
New Hampshire:											
Concord	0	------	0	0	0	0	0	0	0	1	13
Nashua	0	------	--------	28	-------	0	0	-------	0	0	-------
Vermont											
Barre	------	------	--------	------	-------	------	------	-------	------	------	-------
Burlington	0	------	0	4	0	3	0	0	0	1	6
Massachusetts											
Boston	3	------	0	188	14	65	0	10	2	52	203
Fall River	0	------	0	3	1	5	0	1	0	1	26
Springfield	0	------	0	1	0	5	0	2	0	5	25
Worcester	0	------	0	0	5	18	0	1	0	17	40
Rhode Island:											
Pawtucket	0	------	0	2	0	1	0	0	0	0	19
Providence	0	------	0	9	3	11	0	5	0	12	64
Connecticut											
Bridgeport	0	1	0	1	2	11	0	1	0	0	36
Hartford	1	------	1	7	0	17	0	1	0	0	32
New Haven	0	------	0	1	3	1	0	0	0	3	45
New York:											
Buffalo	2	------	1	57	19	20	0	12	0	25	155
New York	45	6	6	319	123	354	0	93	1	138	1,445
Rochester	2	------	0	2	9	55	0	0	0	6	71
Syracuse	1	------	0	54	0	8	0	3	0	43	52
New Jersey:											
Camden	1	------	1	15	0	9	0	1	0	5	37
Newark	0	6	0	45	11	18	0	9	0	47	109
Trenton	0	------	0	83	1	15	0	0	0	6	28
Pennsylvania											
Philadelphia	5	2	0	386	42	101	0	26	0	33	499
Pittsburgh	9	7	5	249	25	40	0	7	3	35	174
Reading	1	------	1	8	0	4	0	0	0	4	22
Scranton	0	------	--------	0	-------	0	0	-------	0	7	-------
Ohio:											
Cincinnati	3	------	0	6	17	33	0	12	0	13	139
Cleveland	7	11	0	252	18	159	0	10	0	80	185
Columbus	1	------	0	5	3	63	0	8	0	24	70
Toledo	1	2	1	212	9	58	0	3	0	80	68
Indiana											
Fort Wayne	3	------	0	22	3	7	0	1	0	1	23
Indianapolis	1	------	0	485	17	12	0	4	0	27	-------
South Bend	0	------	0	4	3	5	0	1	0	0	20
Terre Haute	0	------	0	0	1	0	0	1	0	0	21
Illinois:											
Chicago	3	2	1	669	65	304	0	23	2	141	690
Cicero	------	------	--------	------	-------	------	------	-------	------	------	7
Springfield	------	------	--------	------	-------	------	------	-------	------	------	-------
Michigan:											
Detroit	6	4	1	169	30	164	0	21	0	82	278
Flint	1	------	0	14	4	65	0	1	0	12	18
Grand Rapids	0	------	0	9	4	27	0	2	0	2	32
Wisconsin:											
Kenosha	0	------	0	1	1	8	0	1	0	3	10
Milwaukee	0	------	0	135	12	109	0	5	0	97	100
Racine	0	------	0	1	1	5	0	1	0	0	12
Superior	0	------	0	2	1	1	0	1	0	0	5
Minnesota:											
Duluth	0	------	0	1	0	4	0	0	0	1	20
Minneapolis	2	------	2	10	10	21	0	1	0	23	90
St. Paul	0	------	0	8	9	6	0	2	0	26	69
Iowa:											
Des Moines	1	------	--------	0	-------	16	0	-------	0	0	26
Sioux City	0	------	--------	131	-------	1	0	-------	0	3	-------
Waterloo	0	------	--------	------	-------	2	0	-------	0	5	-------
Missouri											
Kansas City	0	------	0	11	8	12	0	5	0	29	107
St. Joseph	1	------	0	7	1	0	0	3	0	1	48
St. Louis	12	------	0	16	10	14	0	11	1	40	209

City reports for week ended May 19, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
North Dakota											
Fargo	0		1	6	1	3	0	0	0	4	13
Grand Forks	0			0		1	0		0	0	
South Dakota											
Aberdeen	0			69		0	0		0	27	
Sioux Falls	0			6		0	0		0	0	
Nebraska											
Omaha	2		0	106	7	18	4	2	0	3	68
Kansas											
Topeka	0		0	36	3	0	0	0	0	28	18
Wichita	1		0	30	5	0	0	2	0	11	38
Delaware											
Wilmington	0			25		2	0		0	1	
Maryland											
Baltimore	2	1	1	1,630	23	31	0	15	7	94	218
Cumberland	0		0	6	1	1	0	0	0	0	16
Frederick	0		0	3	0	0	0	0	0	0	4
District of Columbia											
Washington	2	1	1	75	9	17	0	10	2	21	129
Virginia											
Lynchburg	1		0	66	1	0	0	1	0	10	10
Norfolk	0		0	0	0	1	0	2	0	3	31
Richmond	1		0	195	3	2	0	4	1	1	43
Roanoke	0		0	11	0	0	0	0	0	0	14
West Virginia											
Charleston	1		0	47	0	1	0	0	0	1	8
Huntington	0			1		8	0		0	0	
Wheeling	0		0	6	2	25	0	0	0	3	14
North Carolina											
Raleigh	0		0	10	3	1	0	0	1	27	11
Wilmington	0		0	13	2	0	0	0	0	10	17
Winston-Salem	1	1	1	6	1	2	0	0	0	6	14
South Carolina											
Charleston	0	2	0	17	2	1	0	1	0	2	16
Greenville	0		0	0	0	0	0	1	0	4	16
Georgia											
Atlanta	0	7	1	38	3	0	0	5	12	4	64
Brunswick	0		0	5	1	0	0	0	0	0	4
Savannah	1	37	0	20	3	0	0	1	1	13	39
Florida											
Miami	0		0	85	1	0	0	0	2	4	19
Tampa	2		0	70	0	0	0	0	0	0	16
Kentucky											
Ashland	1			20		1	0		0	2	
Lexington	1		0	65	2	3	0	2	0	20	19
Tennessee											
Memphis	2		2	31	8	4	0	5	0	18	62
Nashville	1		1	6	3	3	0	0	0	5	35
Alabama											
Birmingham	0	2	2	116	4	3	0	4	1	2	69
Mobile	1		0	11	2	1	0	3	0	0	24
Montgomery	0			74		2	0		0	9	
Arkansas											
Fort Smith	0			0		0	0		0	1	
Little Rock	3		0	0	3	1	0	3	0	4	6
Louisiana											
New Orleans	10	5	4	50	8	7	1	18	2	0	143
Shreveport	1		0	4	3	0	0	1	0	3	31
Oklahoma											
Oklahoma City	1	10	0	0	4	2	0	5	1	0	51
Tulsa	0			0		2	0		0	10	
Texas											
Dallas	4	1	1		5	4	0	3	0	25	56
Fort Worth	1		0		3	1	0	3	0	5	31
Galveston	0		0	0	1	0	0	1	0	0	10
Houston	4		0	1	8	5	0	3	0	0	72
San Antonio	0		0	1	6	2	0	5	1	3	78
Montana											
Billings	0		0	0	0	0	0	0	0	2	10
Great Falls	0		0	7	2	0	0	0	0	0	12
Helena	0		0	0	0	0	0	0	0	0	5
Missoula	0		0	0	0	0	0	0	0	0	4
Idaho											
Boise											

City reports for week ended May 19, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Colorado											
Denver	5	23	0	541	3	12	0	4	0	59	80
Pueblo	0		0	20	0	1	0	2	1	19	8
Utah											
Salt Lake City	0		1	24	4	6	1	1	0	69	224
Nevada											
Reno	0		0	31	0	1	0	0	0	3	
Washington:											
Seattle	0			12		26	0		0	57	
Spokane	0		0	3	3	0	0	0	0	31	30
Tacoma	0		0	74	2	3	0	0	0	13	24
Oregon											
Portland	0		0	20	6	17	0	1	0	7	80
Salem	0			1		1	0		0	2	
California											
Los Angeles	10	15	1	26	14	45	0	10	1	62	283
Sacramento	0		0	2	0	8	0	6	[1] 1	5	20
San Francisco	1	1	0	320	6	5	0	11	1	22	145

State and city	Meningococcus meningitis		Poliomyelitis cases	State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths			Cases	Deaths	
New York				Wisconsin:			
New York	2	0	0	Milwaukee	1	0	0
Pennsylvania				Iowa			
Philadelphia	4	1	0	Des Moines	2	0	0
Pittsburgh	0	1	0	Missouri:			
Ohio				Kansas City	0	1	0
Cincinnati	5	7	0	St. Joseph	1	1	0
Cleveland	0	0	1	Oklahoma			
Illinois				Oklahoma City	0	2	0
Chicago	4	0	0	California			
				Los Angeles	0	1	9

Lethargic encephalitis.—Cases: New York, 2; Detroit, 1; St. Joseph, 1.
Pellagra.—Cases: Savannah, 6; New Orleans, 1; Dallas, 2; Denver, 1.
Rabies in man.—Houston, 1 death.
Typhus fever.—Cases: Savannah, 1; Fort Worth, 1.

[1] Nonresident.

FOREIGN AND INSULAR

PUERTO RICO

Notifiable diseases—4 weeks ended May 19, 1934—During the 4 weeks ended May 19, 1934, cases of certain notifiable diseases were reported in the municipalities of Puerto Rico as follows.

Disease	Cases	Disease	Cases
Chicken pox	99	Pellagra	17
Diphtheria	39	Puerperal fever	1
Dysentery	63	Ringworm	4
Erysipelas	4	Syphilis	5
Filariasis	3	Tetanus	7
Influenza	33	Tetanus infantile	2
Leprosy	2	Trachoma	52
Malaria	1,543	Tuberculosis	482
Measles	117	Typhoid fever	34
Mumps	33	Whooping cough	163
Ophthalmia neonatorum	6		

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for May 25, 1934, pp 636–648 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued June 29, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands—No cholera was reported in the Philippine Islands for the week ended May 26, 1934.

Plague

United States—A report of plague-infected ground squirrels in Kern County, in the interior of the State of California, appears on page 691 of this issue of Public Health Reports.

Yellow Fever

Brazil.—The case of yellow fever reported as having occurred in Mato Grosso State, Brazil, during the week ended April 28, 1934, occurred during the week ended May 5, in the locality of Coronel Ponce.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 24

JUNE 15 - - - - 1934

IN THIS ISSUE

Fumigation Deaths and Deaths From Other Poisonous Gases
Life Span of Fleas Without a Host in Climate of Manila
Deaths in Large Cities During the Week Ended May 26, 1934
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93, title 44, section 220

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

The PUBLIC HEALTH REPORTS is published primarily for distribution, in accordance with the law, to health officers, members of boards or departments of health, and other persons directly or indirectly engaged in public-health work Articles of special interest are issued as reprint or as supplements, in which forms they are made available for more economical and general distribution.

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Librarians and others should preserve their copies for binding, as the Public Health Service is unable to supply the general demand for bound copies. Indexes will be supplied upon request.

CONTENTS

Page

Fumigation deaths as compared with deaths from other posionous gases 697
Life span of fleas without a host under normal atmospheric conditions occurring in Manila 699
Court decisions on public health 712
Deaths during week ended May 26, 1934:
  Deaths and death rates for a group of large cities in the United States 712
  Death claims reported by insurance companies 712

PREVALENCE OF DISEASE

United States
  Current weekly State reports:
    Reports for weeks ended June 2, 1934, and June 3, 1933 713
  Summary of monthly reports from States 715
  Plague-infected ground squirrels in Tulare County, Calif 716
  Weekly reports from cities
    City reports for week ended May 26, 1934 716
Foreign and insular
  Canada:
    Ontario Province—Communicable diseases—4 weeks ended April 28, 1934 719
    Quebec Province—Communicable diseases—2 weeks ended May 19, 1934 719
  Cuba—Habana—Communicable diseases—4 weeks ended May 19, 1934 719
  Czechoslovakia—Communicable diseases—March 1934 720
  Great Britain—Scotland—Vital statistics—Quarter ended March 31, 1934 720
  Italy—Communicable diseases—4 weeks ended December 10, 1933 720
  Jamaica—Communicable diseases—4 weeks ended May 19, 1934 721
  Cholera, plague, smallpox, typhus fever, and yellow fever:
    Cholera 721
    Plague 721
    Smallpox 721
    Yellow fever 721

PUBLIC HEALTH REPORTS

VOL. 49 JUNE 15, 1934 NO. 24

FUMIGATION DEATHS AS COMPARED WITH DEATHS FROM OTHER POISONOUS GASES

By C L. WILLIAMS, *Senior Surgeon, United States Public Health Service*

In view of the great stress customarily laid upon the possible hazard incident to fumigation with poisonous gases, a national news clipping survey covering a period of 6 months was carried out with a view to establishing a basis for comparison between the number of deaths due to fumigation and those caused by the inhalation of other lethal gases.

The type of fumigation referred to is not that carried out in homes after communicable disease, since the number of such fumigations has in the past several years diminished until the practice at the present time is practically of negligible moment; but it relates most particularly to the practice of fumigation of railway cars, vessels, warehouses, grain elevators, private dwellings, etc , performed for the purpose of destroying disease-carrying rodents and insect pests.

The relationship determined as a result of this study shows a markedly low percentage of deaths due to fumigant gases.

Practically all fumigation accidents are the result of negligence or ignorance; and so adequate legislation by all cities and the proper enforcement of such legislation, providing for the handling of fumigants and the performance of fumigations by none but thoroughly-trained operators, would tend to reduce the present small number of fumigation deaths. The following recent cases are cited to illustrate the causes of most fumigation accidents:

1. During the fumigation of a schooner, the man who was killed evidently broke open the sealed door on the galley and walked directly into the gas. No guard had been set to prevent persons from entering, entire reliance being placed on a warning.

2. The case of a child reported having been killed while asleep, following fumigation of the apartment, was due to insufficient airing of the quarters prior to reoccupancy. Some of the gas was, in consequence, retained in the mattresses and other bedding and subsequently released in sufficient quantity to cause the death of the most intimately exposed member of the family, that is, the child. The fumigator presumably was unaware of the dangers from gas absorbed in bedding.

3. During the fumigation of a flour mill, the employee who handled the fumigant descended into a closed bin to spread it around. This death was undoubtedly due to the victim's ignorance of the extremely rapid action of the gas employed.

4. The apparent neglect on the part of the fumigators to guard a rear entrance of the dwelling that they were fumigating brought about the death of the innocent victim involved, who, ignorant of the fumigation, unlocked the rear door with a pass-key and walked into the gas.

During the 6-month survey, the number of deaths reported in the press clippings reviewed which occurred from fumigant gases in the United States totaled 6, while deaths resulting from the inhalation of other poisonous gases numbered for the same period 382.

According to information obtained from available sources, it is estimated that the number of building, railway, and ship fumigations performed in the United States during 1933 was approximately 74,000. Of this number, about 60,000 were fumigations of domestic dwellings, 5,000 industrial fumigations, 7,000 railway cars, and 2,000 ships In addition to these, there are performed yearly a large number of horticultural fumigations, for which it is difficult to arrive at a definite estimate owing to the fact that these fumigations are figured in "acres of glass." There are about 15,000 greenhouse companies in the United States, many of which own long ranges of greenhouses. Greenhouses fumigate at least once every month during the growing season, and mushroom houses several times during the year. The year 1933 having been a subnormal year, the estimates cited above may be considered conservative. From these figures it would appear that the deaths average about 1 to every 6,000 fumigations.

The census reports for 1932 (the latest figures presently available) list 1,988 accidental deaths from poisonous gases in the registration area, including a population of 119,658,000. Assuming that the survey ratio of deaths from fumigations to total deaths from poisonous gases obtained in this population, there would have been 31 deaths from fumigation—a much higher figure than indicated in this study. It is felt, however, that this ratio is not applicable; for, while newspapers may fail to publish accounts of many deaths certified by attending physicians as due to poisonous gases, it is believed that it is very rare that deaths of this nature due to fumigations fail to get extensive mention in the press. Nearly all of those of which clippings were received, were featured.

The accompanying table gives a summary of deaths from poisonous gases in the United States reported in the newspapers during the period from October 1, 1933, to March 31, 1934:

Type of gas	Number of deaths	Number overcome	Type of gas	Number of deaths	Number overcome
Auto exhaust	230	11	Illuminating gas	27	17
Auto exhaust while driving	3	2	Chemical fumes	8	2
Coal gas	49	66	Miscellaneous	23	15
Gas and oil heaters	42	16	Fumigants	6	4

THE DEADLY AUTO EXHAUST

It will be noted that the deaths from auto exhaust gas, carbon monoxide, average over one a day, a number far out of proportion to deaths from other accidents. Especially during the winter months is the large number of fatalities from this gas predominant, the advent of the winter season each year invariably brings in its wake, in every State in the country, a large increase in the toll of deaths from the insidious carbon monoxide gas that is generated by the exhaust of automobiles, and not enough stress can, therefore, be laid on this prevalent danger. In cold weather it is an all too common occurrence for motorists, in closed garages, to keep the engine running in order to "warm it up", or to work on the car with the engine running in a closed or improperly ventilated garage Even some veteran motorists and mechanics have become victims. Because it overcomes its victims rapidly with sudden and unexpected weakness, leaving them at once in a state that renders them incapable of calling for aid, the gas is particularly treacherous. Automobile exhaust gas contains sufficient carbon monoxide to render the atmosphere of a small private garage deadly within a very few minutes if the garage doors are closed while the engine is running.

CONTROL BY LAW

To legislate effectively against the automobile exhaust in situations above described is obviously absurd and manifestly impossible; the control of this hazard is eminently a field for an educational campaign. Fumigation, however, is within the proper scope of local legislative control. Notwithstanding the relatively small numbers of fatalities at present occurring from this cause, nevertheless in view of the trend toward increased use of lethal gases for domestic purposes, the adoption of reasonable legislation for the control of the practice is believed advisable; but at present it is apparently not a matter justifying emergency or ill-considered enactments.

LIFE SPAN OF FLEAS WITHOUT A HOST UNDER NORMAL ATMOSPHERIC CONDITIONS OCCURRING IN MANILA

By R W. Hart, *Surgeon*, and E R. Pelikan, *Passed Assistant Surgeon, United States Public Health Service*

An effort was made to determine the life span of fleas without a host under the natural atmospheric temperatures and humidity obtaining in Manila.

A considerable amount of work had already been done on this subject by others, but most of it dealt with fleas living under decidedly different conditions of temperature and humidity from those obtaining

either in Manila or Calcutta or in the seas lying between, where there is only a minor temperature range, as will be seen from the accompanying tables.

The present investigation had its inception in the fact that on two different occasions the Japanese sanitary authorities had reported the occurrence of plague in or near one of their ports, Osaka, and believed that they were able to rule out the presence of infected rodent hosts. They maintained that, on both occasions, plague had been introduced through the agency of free living fleas present on bales of cotton shipped from India. While there was some doubt as to whether this was actually the case, it was considered that this method for the transmission of plague was a possibility; and as certain types of cargo of a somewhat similar nature were frequently shipped from Indian ports to the Philippines, the experiments outlined here were carried out in an effort to determine whether or not such cargo might constitute a menace to the Islands unless it was treated for the destruction of fleas prior to being discharged.

As most of the cargo of this type arrived on vessels which had been ratproofed, for practical purposes it was necessary to consider only the possible transmission of plague by free living fleas. The problem was furthermore simplified by the fact that the time consumed by the voyage from the nearest Indian port was never less than 12 days, so that the actual problem presented was to determine whether cargo shipped from one or another Indian port might harbor fleas which had been infected with plague in India and which still remained viable on arrival in a Philippine port, and whether such fleas might infect a rodent host after this period of time had elapsed. It was known that the plague bacillus would live much longer than this under certain conditions, but it was by no means certain that infected fleas could live without a host for this period of time under the comparatively high temperatures and humidity which are normal during practically the entire year for this district

William Nicoll,[1] states that he and his assistants conducted certain experiments on the longevity of fleas, in which a total of 638 fleas were used. Of this number, 463 fleas were used in determining the life span at ordinary room temperatures, which during the daytime in summer varied from 15° to 23° C. and in winter from 10° to 17° C. No mention is made of the saturation deficiency of the air under which the fleas were kept, although in some of the experiments moisture was added. The effect of light, shade, and darkness on the life span was also investigated.

He concludes that—

"1. The average length of life of *Ceratophyllus fasciatus* apart from its host under general conditions is just under 7 days, but about 9

[1] British Medical Journal, vol 2 (Oct. 12, 1912), pp. 926-928.

percent live for a fortnight and at least 2 percent for 3 weeks or over (of the 505 fleas 46 lived at least 14 days and 10 at least 21 days)

"2. Other things being equal, they live longer in winter than in summer; that is, longer at low temperatures than at high. Under ordinary circumstances, when the temperature is over 15° C. for any considerable part of the time, it would be exceptional for them to live, without feeding, for more than 40 days, but from experiments * * * it is evident that in winter, when the temperature remains continuously under 10° C. (50° F.), they may remain alive for as long as 2 months, and if the temperature is maintained continuously at freezing point this period may be extended over 10 weeks.

"3. Above 25° C., the length of life is greatly curtailed, and at 37° C, it is always less than 24 hours, though in some cases more than 12 hours

"4. Both excess of dryness and excess of moisture curtail the length of life

"5 Conditions of light do not appear to have any great influence, but in these experiments the fleas exposed to bright daylight lived on an average slightly longer than those kept in darkness or in the shade; the average figures being, respectively, 6 9, 6.6, and 5.8 days."

Fox and Sullivan quote Bacot as follows: [2]

"Bacot further states that at 45° F. [7 2° C] to 50° F [10° C], with nearly saturated air, fleas can live for many days unfed—*Pulex irritans* for 125 days, *Ceratophyllus fasciatus* for 95 days, *Xenopsylla cheopis* for 35 days, *Ctenocephalus canis* for 58 days, and *Ceratophyllus gallinae* for 127 days. * * * Allowing for the longest recorded time that an unfed adult flea lives, there is no difficulty in accounting for active adult fleas being found, under favorable situations, where there have been no hosts for considerable periods—*Ceratophyllus fasciatus* for 22 months, *Pulex irritans* for 19 months, *Xenopsylla cheopis* for 10 months, *Ctenocephalus canis* for 18 months, and *Ceratophyllus gallinae* for 12 months."

Bacot and Martin,[3] have reported on "The respective influences of temperature and moisture upon the survival of the rat flea (*Xenopsylla cheopis*) away from its host."

(A) The following statements are taken from the section of their paper entitled "The influence of varying saturation deficiency on the longevity of fleas, temperature being constant."

A mixed population of fleas, *X. cheopis*, was used, 100 fleas for each experiment. The temperature was kept at 32° C. (89.6° F.) and air current through bottle at 100 cc per minute. From table 2 of the article referred to it is noted that—

1. At temperature 32° C., with relative humidity of 89 percent and saturation deficiency of 4 mm, out of the 100 fleas 50 were dead at the end of 6¼ days, 90 were dead at the end of 8¾ days. All dead at the end of 11 days.

2. At a temperature of 32° C., with relative humidity of 72 percent and saturation deficiency of 10 mm, out of the 100 fleas about 50

[2] Public Health Reports, Sept 11, 1925, p. 1913.

[3] Journal of Hygiene, vol. 23 (1924–25), p. 102 et seq.

were dead at the end of 3 days, and all were dead at the end of 7½ days.

3. At a temperature of 32° C., with a relative humidity of 55 percent and saturation deficiency of 16 mm, 50 were dead at the end of 2 days, and all were dead at the end of 5 days.

4. At a temperature of 32° C., with a relative humidity of 27 percent and saturation deficiency of 26 mm, 50 were dead in a little over 24 hours, and all were dead at the end of 3 days.

(B) In the section of the paper under the subheading "The influence of temperature on the longevity of fleas when the saturation deficiency is kept constant", the authors report that two experiments were performed in this determination, 100 fleas being used in each experiment. The statements show that—

1. In one experiment in which 100 fleas were kept at a temperature of 32° C., with a saturation deficiency of 10 mm, 50 were dead in a little over 3 days, and all were dead in 7½ days.

2. In the other experiment, in which 100 fleas were kept at a temperature of 21° C., with a saturation deficiency of 10 mm, 50 were dead in a little over 4½ days, and all were dead in 10 days.

The author concludes:

"(1) The survival of fleas (*X. cheopis*) apart from their host is approximately in inverse proportion to the saturation deficiency of the air, provided that the temperature and air movement are constant. In other words, it is proportional to the rate at which they lose water.

"(2) Under similar conditions but with constant saturation deficiency, their length of life is reduced to between one half and two thirds by 10° C. rise in temperature * * *."

In the Report on Plague Investigation in India, issued by the advisory committee,[4] it is stated that a number of experiments were performed in order to obtain information on how long *X. cheopis* could survive without food in different circumstances. In one series of experiments, 150 fleas were added to each of the following-named materials and the time when all, or nearly all, of the fleas were dead was noted. They were kept without a host. The following table is taken from the report (table 2):

Serial number of the experiment	Material in which the fleas were placed	Number of days the fleas survived
1	Bran	All dead in 6 days.
2	do	Do
3	Bran with moisture	All dead in 7 days
4	Cotton rags	All dead in 6 days
5	Gunny bags or sacking	Do
6	Rice and pulse	Do.
7	Sand with moist cow dung in one portion of the box	15 alive on sixth day.
8	do	3 alive on eighth day.
9	do	All dead on eleventh day.
10	do	All dead on fourteenth day.
11	do	4 alive on eleventh day.
12	do	1 alive on thirteenth day.

[4] Journal of Hygiene, vol. 8 (May 1908), p. 237 et seq

No mention is made of the conditions—that is, temperature and humidity—under which these experiments were performed. The report further states [5]

"From what has been said above it will be apparent that merchandise and grain, which has been visited by rats, may have fleas deposited on them and these fleas may be transferred with these articles to distant places. It is necessary to qualify this statement by pointing out that adult fleas, in the absence of any host to feed on, rapidly die, generally in about 5 days However, larvae, since they can feed upon almost any kind of organic rubbish, and pupae, which require no food, could be carried considerable distances in merchandise, i.e for periods as long as 1 or 2 months. The larvae and pupae so carried would in course of time develop into adult insects, other circumstances being favorable, but would then require a host to feed upon In the absence of a suitable host they would perish within a fortnight of the time of their development into the adult or imago state",

Most of the fleas used in our experiments were obtained from wild rats, trapped and furnished by the Philippine Health Service In all, 133 rats were used, from which 287 fleas were removed and placed under observation. Forty-three additional rat fleas were used and also 179 which were obtained from dogs.

In the beginning of the work the fleas were obtained from the rats killed by a blow on the head. The rats were first combed and then placed in a container for a period of 24 hours in order to obtain any fleas missed by combing By this method very active fleas were obtained The method used later was to anaesthetize both rats and fleas by the use of chloroform; then, on combing the rats, the anaesthetized fleas were more easily combed out and usually became active within a few minutes Only those fleas which recovered within 5 minutes were used. The 179 fleas obtained from dogs were picked off by hand without the use of an anaesthetic.

Of the 520 fleas used, 486 were classified as follows: 73 *Xenopsylla cheopis*, 123 *Xenopsylla astia*, 90 *Ctenocephalus felis*, and 100 *Ctenocephalus canis*. Thirty-four fleas were not identified.

In carrying out these observations most of the fleas were kept under normal Manila atmospheric conditions, with a piece of dry gunny cloth in each container. A small number were kept in closed containers in which the humidity was raised (possibly close to 100 percent) by placing either wet gunny cloth or cotton in the bottom.

From table 10 it will be seen that the life span of fleas kept under conditions of normal atmospheric temperatures and humidity varied but little from month to month. The average varied from 2.3 days in the month of November to 1 day during April and May. The longest period of survival in this group was 5 days.

In those experiments in which the humidity in the containers was raised (performed during the months of August, September, and

[5] Ibid, p. 255.

October only), it will be noted (table 10) that the average period of survival was 3.7 days for the months of August and September and 4.5 days for October The longest period of survival for this group was 12 days.

Dr. Manalang, of the Philippine Health Service, assisted in this work to the extent of observing longevity on 34 fleas during the months of August and September. His results tallied very closely with ours.

Arrangements were made with the agents of a steamship company having vessels plying between Calcutta and Manila to have the masters of these vessels furnish us a record of the maximum and minimum daily temperatures of one hold and on the bridge during several trips. We also requested that the percentage of relative humidity in the same places on shipboard be furnished. Tables 11, 12, 13, 14, and 15 give the figures for the months of December, January, February, March, and May. Although the time during the day when temperatures and humidities were taken in some cases did not give the maximum and minimum, they did give an approximation sufficient for all practical purposes in this investigation. On comparing these averages with the average monthly temperature and relative humidity in Manila, as shown in tables 1, 2, 3, 4, 5, 6, 7, 8, and 9, it will be seen that these are within the range of conditions at Manila and probably comparable in their effect on the life span of fleas. This being the case, it may, therefore, be assumed that any fleas present on cargo shipped from Calcutta to Manila would probably have about the same period of survival as those at Manila, provided that no rodent hosts were present upon which the fleas could feed.

It was concluded, therefore, that, under the usual atmospheric conditions and without a host, the life span of fleas would probably not ordinarily be more than 5 days. However, on voyages during which considerable rain was encountered, extending throughout the voyage, thereby raising the percentage of relative humidity within the holds, the life span of some fleas might be extended to longer periods (possibly 12 days). This would come within 1 day of the time that some vessels require to make the trip from the nearest of the Indian ports to Manila. Such voyages would, for the immediate present, probably be rare. It is, therefore, considered that the possibility of plague-infected fleas arriving at Manila from India is very slight, although it may exist.

The following tables present the detailed data of the observations.

TABLE 1.—*Longevity of fleas, in days, August and September, 1932*

Average maximum monthly temperature........ 32.5° C. (90.5° F.)
Average minimum monthly temperature........ 23.9° C. (75.0° F.)
Average relative humidity........ 84.7 percent

Date	Number of rats	Number of fleas	Number of fleas surviving— 1 day	2 days	3 days	4 days	5 days	6 days	7 days	Remarks
Aug. 29	1	2		1	1					Fleas kept in large empty can.
Do	2	4		3		1				Do.
Do	1	0								
Sept. 1	1	0								
Do	1	3		1		2				Do.
Sept. 3	1	0								
Do	1	1	1							Fleas from now on kept in glass jars.
Sept. 5	1	0								
Sept. 6	1	0								
Sept. 8	1	2	1	1						Piece of gunny material in jar.
Sept. 10	2	0								
Sept. 12	2	0								
Sept. 15	2	1		1						Dry gunny material in jar.
Sept. 18	1	2	2							Wet gunny material in jar.
Sept. 19	2	2	2							Do.
Sept. 24	3	8	1			3	1	3		Wet gunny at top of jar, dry gunny at bottom. Jar covered.
	------	7	3	1	2	1				Dry gunny material in jar.
Sept. 25	1	2	1			1				Do.
Sept. 26	1	0								
Sept. 28	1	2		1		1				Wet gunny material in jar.
Sept. 29	1	1					1			Dry gunny material in jar.
Total	27	37	11	9	3	9	2	3		

TABLE 2.—*Longevity of fleas during the period Aug. 5–Oct. 3, 1932, according to Dr. Manalang*

Average maximum monthly temperature........ 32.5° C. (90.5° F.)
Average minimum monthly temperature........ 23.9° C. (75.0° F.)
Average relative humidity........ 84.7 percent

Date	Number of fleas	Number of fleas surviving— 1 day	2 days	3 days	4 days	5 days	6 days	7 days	8 days	9 days	10 days	Remarks
Aug. 5	6	4		2								Normal atmospheric conditions.
Aug. 6	11	3	8									Do.
Do	1		1									Do.
Aug. 10	2	1									1	Cotton in bottle saturated with water.
Aug. 12	3		1				2					Do.
Do	1								1			Do.
Aug. 31	1									1		Do.
Sept. 26	4				2	2						Do.
Do	3		2	1								Do.
Oct. 3	2		1	1								Do.
Total	34	8	13	4	2	2	2		1	1	1	

TABLE 3.—*Longevity of fleas, in days, during October, 1932*

Average maximum monthly temperature .... 31 4°C (88 3°F)
Average minimum monthly temperature .... 24 0°C (75 2°F.)
Average relative humidity .... [illegible] percent

Date	Number of rats	Number of fleas	Number of fleas surviving— 1 day	2 days	3 days	4 days	5 days	6 days	7 days	Remarks
Oct 2	3	2			2					With dry piece of gunny
Do	2	0								
Oct 3	2	0								
Oct 7	1	2	1	1						Do
Do	3	[1] 9		3	2	1	1			With dry piece of gunny at bottom, wet piece of gunny at top Jar closed
Oct 9	1	0								
Oct 12	1	0								
Oct 13	2	0								
Do	2	4	1	1		2				With dry gunny material
Oct 15	1	1		1						Do
Oct 17	1	3		3						Do
Do	1	2		2						Do
Oct 21	1	1	1							Do.
Oct 27	2	0								
Oct 30	2	3	2	1						Do
Do	2	0								
Total	27	27	5	12	4	3	1			

[1] 1 flea died at end of eighth day, 1 at end of twelfth day

TABLE 4.—*Longevity of fleas, in days, during November, 1932*

Average maximum monthly temperature .... 30 3° C (86 0° F)
Average minimum monthly temperature .... 23 1° C (73 4° F)
Average relative humidity .... 84 5 percent

Date	Number of rats	Number of fleas	Number of fleas surviving— 1 day	2 days	3 days	4 days	5 days	6 days	7 days	Remarks
Nov 2	1	0								
Nov. 4	2	1				1				
Nov 6	2	0								
Nov 9	2	0								1 flea dead when obtained
Nov 10	1	0								
Nov 12	2	16	1	5	7	2	1			4 fleas dead when obtained
Do	1	10	3	3	2	1	1			3 fleas dead when obtained
Nov 13	1	5		5						4 fleas dead when obtained
Nov 14	1	4	2		1	1				3 fleas dead when obtained
Nov. 18	2	1	1							1 flea dead when obtained.
Nov 20	1	1		1						
Nov 24	2	0								
Nov 28	3	11	4	7						Do.
Total	21	49	11	21	10	5	2			17 additional dead fleas obtained from rats.

All fleas remained under normal atmospheric conditions in glass jars with a piece of dry gunny material in bottom of the jars.

TABLE 5.—*Longevity of fleas, in days, during December, 1932*

Average maximum monthly temperature .... 30.7° C (87.0° F.)
Average minimum monthly temperature .... 22.3° C (71.6° F.)
Average relative humidity .... 82.8 percent

Date	Number of rats	Number of fleas	Number of fleas surviving— 1 day	2 days	3 days	4 days	5 days	6 days	7 days	Remarks
Dec. 4	2	2	1	1						4 fleas dead when obtained
Dec. 7	1	2	1		1					2 fleas dead when obtained
Dec. 14	1	1		1						
Dec. 16	2	1		1						
Dec. 19	1	0								
Dec. 22	1	0								1 flea dead when obtained
Total	8	6	2	3	1					7 additional dead fleas obtained from rats

All fleas remained under normal atmospheric conditions in glass jars with a piece of dry gunny material in bottom of jars.

TABLE 6.—*Longevity of fleas, in days, during January, 1933*

Average maximum monthly temperature .... 29.5° C (85.1° F.)
Average minimum monthly temperature .... 19.2° C (66.2° F.)
Average relative humidity .... 74 percent

Date	Number of rats	Number of fleas	Number of fleas surviving— 1 day	2 days	3 days	4 days	5 days	6 days	7 days	Remarks
Jan. 5	4	1		1						
Jan. 14	6	4	2		2					1 flea dead when obtained.
Jan. 22	1	2			2					8 fleas dead when obtained.
Jan. 27	2	0								
Jan. 30	2	2		2						
Total	15	9	2	3	4					9 additional dead fleas obtained from rats

All fleas remained under normal atmospheric conditions in glass jars with a piece of dry gunny material in bottom of jars.

TABLE 7.—*Longevity of fleas, in days, during February, 1933*

Average maximum monthly temperature .... 30.6° C (87.0° F.)
Average minimum monthly temperature .... 20.1° C (68.0° F.)
Average relative humidity .... 71.3 percent

Date	Number of rats	Number of fleas	Number of fleas surviving— 1 day	2 days	3 days	4 days	5 days	6 days	7 days	Remarks
Feb. 11	2	3	2	1						
Feb. 12	2	22	10	10	2					2 fleas dead when obtained.
Feb. 17	6	10	5	4	1					3 fleas dead when obtained.
Feb. 25	1	3	2	1						
Feb. 27	1	0								
Feb. 29	5	0								
Total	17	38	19	16	3					5 additional dead fleas obtained from rats

All fleas remained under normal atmospheric conditions in glass jars with a piece of dry gunny material in bottom of jars.

TABLE 8.—*Longevity of fleas, in days, during March, 1933*

Average maximum monthly temperature .... 31.4° C. (88.5° F.)
Average minimum monthly temperature .... 21.5° C. (70.7° F.)
Average relative humidity .... 70.6 percent

Date	Number of rats	Number of fleas	Number of fleas surviving— 1 day	2 days	3 days	4 days	5 days	6 days	7 days	Remarks
Mar. 4	6	23	9	7	5	------	2	------	------	5 fleas dead when obtained.
Mar. 11	5	20	8	8	4	------	------	------	------	4 dead fleas when obtained.
Mar. 25	3	11	9	2	------	------	------	------	------	5 fleas dead when obtained
Total	14	54	26	17	9	------	2	------	------	14 fleas more were obtained from rats

All fleas remained under normal atmospheric conditions in glass jars with a piece of dry gunny material in bottom of jars

TABLE 9.—*Longevity of fleas, in days, during April and May, 1933*

Maximum temperature .... 33.4° C. (92.1° F.)
Minimum temperature .... 22.4° C. (72.3° F.)
Average relative humidity .... 70.5 percent

Date	Number of rats	Number of fleas	Number of fleas surviving— 1 day	2 days	3 days	4 days	5 days	6 days	7 days	Remarks
Apr. 15	4	35	25	10	------	------	------	------	------	

Maximum temperature .... 35.2° C. (95.4° F.)
Minimum temperature .... 24.4° C. (75.9° F.)
Average relative humidity .... 66.5 percent

Date	Number of dogs	Number of fleas	Number of fleas surviving— 1 day	2 days	3 days	4 days	5 days	6 days	7 days	Remarks
Apr. 22	2	170	170	------	------	------	------	------	------	

Maximum temperature .... 36.1° C. (96.8° F.)
Minimum temperature .... 24.5° C. (76.0° F.)
Average relative humidity .... 60.4 percent

Date	Number of dogs	Number of fleas	Number of fleas surviving— 1 day	2 days	3 days	4 days	5 days	6 days	7 days	Remarks
May 9	1	9	9	------	------	------	------	------	------	

All fleas remained under normal atmospheric conditions in glass jars with a piece of dry gunny material in bottom of jars.

TABLE 10.—*Monthly summary of number of fleas used and the average length of life*

[Fleas kept under normal atmospheric conditions]

Month	Number of fleas	Average longevity in days	Average maximum and minimum temperature		Average relative humidity
			°*F*	°*F*	*Percent*
August and September	39	2.2	90.5	75.0	84.7
October	18	2.0	88.3	75.2	83.4
November	49	2.3	86.0	73.4	84.5
December	6	1.8	87.0	71.6	82.8
January	9	2.2	85.1	66.2	74.0
February	38	1.7	87.0	68.0	71.3
March	54	1.8	88.5	70.7	70.0
April	205	1.0	93.7	74.1	68.5
May	9	1.0	96.8	76.0	60.4
FLEAS KEPT UNDER NORMAL ATMOSPHERIC TEMPERATURE WITH RELATIVE HUMIDITY RAISED TO BETWEEN 95 AND 100 PERCENT					
August and September	32	3.7	90.5	75.0	----------
October	9	4.5	88.3	75.2	----------

TABLE 11.—*Temperatures and humidities during the voyage from Calcutta to Manila, Dec. 9–22, 1932*

Date	At bridge				In hold no. 1			
	8 a.m.		8 p.m.		8 a.m.		8 p.m.	
	Temperature	Relative humidity	Temperature	Relative humidity	Temperature	Relative humidity	Temperature	Relative humidity
	°*F*	*Percent*	°*F*	*Percent*	°*F*	*Percent*	°*F*	*Percent*
Dec. 9	74	70	80	72	78	72	80	72
Dec. 10	81	72	81	75	80	79	85	80
Dec. 11	78	85	82	83	81	77	84	77
Dec. 12	81	83	83	80	83	77	85	80
Dec. 13	82	77	80	79	84	73	86	73
Dec. 14	77	83	80	79	85	82	83	79
Dec. 15	84	72	79	82	87	70	85	77
Dec. 16	79	85	79	81	83	80	86	84
Dec. 17	77	87	78	92	80	85	86	88
Dec. 18	79	91	76	87	82	87	83	84
Dec. 19	79	87	79	92	84	84	84	88
Dec. 20	81	83	79	87	81	87	84	88
Dec. 21	82	70	81	75	83	76	83	73
Dec. 22	82	64	-------	-------	82	72	-------	-------
Averages for trip	80.4	79.2	79.7	81.8	82.3	78.6	84.1	81.7

TABLE 12.—*Temperatures and humidities during the voyage from Calcutta to Manila, Jan. 9–23, 1932, in holds nos 1 and 4*

Date	Hold no 1				Hold no. 4			
	5 p m		8 a m		5 p m.		8 a m	
	Temperature	Relative humidity	Temperature	Relative humidity	Temperature	Relative humidity	Temperature	Relative humidity
	° *F*	*Percent*	° *F*	*Percent*	° *F*	*Percent*	° *F*	*Percent*
Jan 9	78.8	62	89.0	51	75.2	70	78.8	73
Jan 10	82.4	58	89.6	53	81.5	75	77	74
Jan 11	80.6	70	87.8	57	77	75	77.5	75
Jan 12	81.5	80	91.5	59	83.3	80	82.4	75
Jan 13	87.8	58	91.5	55	78.8	75	81.5	71
Jan 14	87.8	67	90.5	58.5	80.6	75	80.6	75.2
Jan 19[1]			93.2	87			86	75
Jan 20	95	84	98.6	86	87.8	76	86	77
Jan 21	91.5	86	93.2	87	86	77	86	76
Jan 22	86	87.5	82.4	90	87.8	79	84	75
Jan 23	82.4	90	82.4	91	82.4	80	85	76
Averages for trip	85.3	74.2	90	70	82	76.2	82.2	74.7

[1] Jan 15, 16, 17, and 18, vessel loading at Singapore, all hatches open

TABLE 13.—*Temperatures and humidities during the voyage from Calcutta to Manila, Feb. 8–22, 1932*

Date	Outside				In hold			
	2 a m		2 p m		2 a m		2 p m	
	Temperature	Relative humidity	Temperature	Relative humidity	Temperature	Relative humidity	Temperature	Relative humidity
	° *F*	*Percent*	° *F*	*Percent*	° *F.*	*Percent*	° *F*	*Percent*
Feb 8			78	87			70	87
Feb 9	76	91	81	84	73	95	82	84
Feb 10	77	87	82	84	79	87	82	92
Feb 11	84	84	85	84	81	92	85	84
Feb 12	83	84	85	81	83	84	86	81
Feb 13	77	95	85	92	81	87	(1)	(1)
Feb. 14			86	84	(1)	(1)	(1)	(1)
Feb 15			86	88	(1)	(1)	(1)	(1)
Feb 16			86	88	(1)	(1)	(1)	(1)
Feb. 17			85	92	(1)	(1)	(1)	(1)
Feb 18	80	92	81	92	82	88	84	84
Feb 19	79	96	81	92	80	96	84	84
Feb. 20	78	91	82	88	78	91	89	88
Feb 21	79	87	81	83	80	87	91	81
Feb. 22	78	87			80	87		
Averages for trip	79.1	89.4	83.1	87.3	79.7	89.4	84.6	85

[1] Hatches open.

TABLE 14.—*Temperatures in hold no. 1 and of outside air during the voyage from Calcutta to Manila, Mar. 8–22, 1932*

[Relative humidity not furnished]

Date	In hold no. 1		Outside air	
	Daily maximum temperature	Daily minimum temperature	Daily maximum temperature	Daily minimum temperature
	°F	°F	°F	°F
Mar. 9	80.6	77.6	86.0	77.0
Mar. 10	84.7	78.5	87.0	75.0
Mar. 11	86.6	78.4	85.0	75.0
Mar. 12	91.4	82.6	87.0	80.0
Mar. 13	89.8	82.2	88.0	80.0
Mar. 14	88.2	83.2	88.0	81.5
Mar. 15	85.7	81.4	86.5	80.7
Mar. 18	84.1	79.3	82.4	77.0
Mar. 19	84.0	81.0	82.5	78.5
Mar. 20	84.0	82.0	81.5	76.0
Mar. 21	82.0	79.8	81.0	78.0
Average for trip	85.5	80.5	84.9	78.0

TABLE 15.—*Temperatures and humidities on voyage from Calcutta to Manila, May 5–21, 1932*

[Reading taken in hatch no. 1, where the Manila cargo was stored]

Date	7 a. m.		5 p. m.	
	Temperature	Relative humidity	Temperature	Relative humidity
	°F	*Percent*	°F	*Percent*
May 8	89.6	75	93.0	63
May 9	87.8	76	91.4	63
May 10	91.4	73	91.4	60
May 11	86.0	74	93.0	61
May 12	89.6	80	91.4	68
May 13	87.8	78	87.8	65
May 14	89.6	79	87.8	62
May 15	89.6	75	91.4	63
May 16	89.6	77	91.4	69
May 17	89.6	79	89.6	65
May 18	91.4	78	95.0	65
May 19	91.4	79	93.0	71
May 20	91.4	78	93.0	71
May 21	89.6	79	91.4	72
Average for trip	89.6	77	91.4	65.5

TABLE 16.—*Classification of fleas used*

Fleas dead at the end of—	Total	Species			
		X. cheopis	X. astia	Ct. felis	Ct. canis
First day (from rats)	101	16	78	4	3
First day (from dogs)	179	0	0	83	96
Second day	91	21	66	3	1
Third day	34	9	25	0	0
Fourth day	17	5	12	0	0
Fifth day	7	7	0	0	0
Sixth day	3	1	2	0	0
Eighth day	1	1	0	0	0
Twelfth day	1	1	0	0	0

The 34 fleas the data for which are presented in table 2 were not identified.

COURT DECISIONS ON PUBLIC HEALTH

Damages allowed for injury to land resulting from sewage disposal.—(Kansas City, Mo , Court of Appeals; *McCleery* v. *City of Marshall*, 65 S.W.(2d) 1042; decided Dec. 4, 1933) An action for damages was brought against the city of Marshall, the complaint being that the plaintiff's real property was injured by reason of a nuisance created by the city when it extended a sewer and discharged sewage therefrom upon adjoining premises. There was a verdict and judgment in the plaintiff's favor, which judgment was affirmed by the court of appeals. The view was taken that the nuisance created by the extension was a permanent one and that the measure of damages was the difference between the reasonable value of the land immediately before and immediately after the extension of the sewer.

Recovery had for personal injuries caused by inhalation of sulphur dust.—(St. Louis, Mo., Court of Appeals; *Langeneckert* v. *St. Louis Sulphur & Chemical Co.*, 65 S.W.(2d) 648; decided Dec. 5, 1933.) An action to recover damages for personal injuries was brought against a company engaged in pulverizing crude sulphur by one who had been employed by it. The plaintiff alleged several acts of negligence under the common law and also alleged violation of certain statutory provisions having reference to the protection of employees against occupational diseases and to the protection of employees engaged in work declared especially dangerous to their health. In the trial court there was a verdict and judgment for the plaintiff, and the court of appeals affirmed the judgment.

DEATHS DURING WEEK ENDED MAY 26, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended May 26, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	8,246	7,741
Deaths per 1,000 population, annual basis	11.5	10.8
Deaths under 1 year of age	613	570
Deaths under 1 year of age per 1,000 estimated live births	57	[1] 48
Deaths per 1,000 population, annual basis, first 21 weeks of year	12.4	11 8
Data from industrial insurance companies		
Policies in force	67,801,274	67,990,952
Number of death claims	13,024	12,224
Death claims per 1,000 policies in force, annual rate	10 0	9.4
Death claims per 1,000 policies, first 21 weeks of year, annual rate	10 9	10.7

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended June 2, 1934, and June 3, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 2, 1934, and June 3, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933
New England States								
Maine				1	6	5	1	0
New Hampshire					101	118	0	0
Vermont		1			39	62	0	0
Massachusetts	11	27			911	539	0	1
Rhode Island	5	1			26	1	0	0
Connecticut			1	2	183	289	0	0
Middle Atlantic States:								
New York	35	30	[1] 3	[1] 10	1,029	2,094	6	5
New Jersey	21	20	5	1	652	946	0	2
Pennsylvania	27	52			2,282	1,257	0	0
East North Central States								
Ohio	37	47	38	94	2,309	613	0	1
Indiana	5	13	15	25	900	211	1	3
Illinois	23	34	32	10	2,280	702	14	29
Michigan	12	28	3	13	421	640	1	2
Wisconsin	4	6	21	26	1,971	330	0	1
West North Central States								
Minnesota	6	8	1	1	218	248	1	3
Iowa [2]	6	4	1		312	108	1	1
Missouri	27	15	13	2	315	196	3	4
North Dakota	6	3			69	268	0	0
South Dakota			1		219	17	2	1
Nebraska	1	3			90	44	0	1
Kansas	4	3			486	261	0	0
South Atlantic States								
Delaware				2	77	14	0	0
Maryland [2]	4	6	3	2	1,207	50	0	1
District of Columbia	10	2		1	33	19	0	1
Virginia	9	6			945	214	1	1
West Virginia	8	4	7	1	161	75	0	0
North Carolina	3	7	3	16	1,047	413	1	1
South Carolina	4	9	134	100	169	252	0	0
Georgia [3]	2	1			99		0	0
Florida	8	3	1	7	230	39	0	0
East South Central States.								
Kentucky	6		9	16	495	63	0	1
Tennessee	6	4	14	14	333	108	2	1
Alabama [3]	9	6	8	14	501	56	0	1
Mississippi [2]	2	4					0	0
West South Central States								
Arkansas	2	3		3	19	240	0	0
Louisiana [3]	11	4	5	18	145	30	1	0
Oklahoma [4]	4	9	15	3	106	130	0	0
Texas [3]	4	30	178	47	829	412	2	2

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 2, 1934, and June 3, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933
Mountain States								
Montana [5]	4	1	3		25	28	1	0
Idaho [5]	2				11	13	0	0
Wyoming [5]	1				146	14	0	0
Colorado	5			23	2,112	16	0	0
New Mexico	4	9		9	62	15	0	0
Arizona	4	2	9	2	12	111	0	0
Utah [2 5]			2	3	31	48	0	0
Pacific States								
Washington		4			192	57	0	0
Oregon [5]	1	1	9	17	12	47	0	1
California	25	38	18	29	118	1,128	2	0
Total	368	448	552	512	24,296	12,570	40	64

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933
New England States								
Maine	0	0	9	18	0	0	6	1
New Hampshire	0	0	6	8	0	0	6	0
Vermont	0	0	19	7	0	0	0	0
Massachusetts	0	0	230	253	0	0	3	7
Rhode Island	0	0	21	28	0	0	1	0
Connecticut	0	0	41	54	0	0	0	3
Middle Atlantic States								
New York	1	2	645	478	0	0	7	4
New Jersey	0	1	133	162	0	0	3	4
Pennsylvania	1	0	397	609	0	0	11	10
East North Central States								
Ohio	1	0	892	1,039	0	7	13	24
Indiana	0	1	71	64	2	0	8	0
Illinois	1	1	522	375	4	2	6	6
Michigan	0	1	478	349	1	0	4	4
Wisconsin	0	1	268	97	19	0	1	3
West North Central States								
Minnesota	0	1	73	81	3	1	2	0
Iowa [2]	1	0	36	17	1	14	2	1
Missouri	1	0	53	51	1	4	8	2
North Dakota	0	0	41	3	0	2	1	2
South Dakota	1	0	4	2	1	0	0	2
Nebraska	0	0	14	5	5	1	0	3
Kansas	1	0	27	31	1	2	2	1
South Atlantic States								
Delaware	0	0	2	7	0	0	0	0
Maryland [3]	0	0	43	81	0	0	8	2
District of Columbia	0	0	7	10	0	0	1	0
Virginia	0	0	18	39	0	0	7	11
West Virginia	1	0	47	20	0	1	11	4
North Carolina	1	0	11	34	0	0	4	18
South Carolina	0	0	1	1	0	0	6	30
Georgia [3]	0	0	2	2	0	0	14	21
Florida	0	0		0	0	0	3	2
East South Central States								
Kentucky	0	3	27	27	0	1	14	12
Tennessee	0	1	19	23	2	1	8	11
Alabama [3]	0	1	5	3	0	1	5	18
Mississippi [2]	0	0	2	6	1	1	5	4
West South Central States								
Arkansas	0	0	3	1	2	0	3	7
Louisiana [3]	2	0	7	2	0	2	10	9
Oklahoma [4]	2	0	7	8	2	0	5	2
Texas [3]	0	1	36	38	33	12	26	18

See footnotes at bottom of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 2, 1934, and June 3, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933	Week ended June 2, 1934	Week ended June 3, 1933
Mountain States								
Montana[5]	0	0	8	6	0	0	2	3
Idaho[5]	0	0	1	6	1	2	0	0
Wyoming[5]	0	0	17	16	0	1	0	0
Colorado	0	0	22	29	2	0	0	0
New Mexico	0	0	6	5	0	0	2	3
Arizona	0	0	4	11	0	0	4	0
Utah[2 5]	0	0	6	7	1	0	0	0
Pacific States								
Washington	1	0	60	40	1	1	3	0
Oregon[5]	1	0	40	25	2	12	0	4
California	163	0	107	132	1	28	3	5
Total	179	14	4,488	4,368	86	96	228	270

[1] New York City only
[2] Week ended earlier than Saturday
[3] Typhus fever, week ended June 2, 1934, 10 cases, as follows Georgia, 3, Alabama, 2, Louisiana, 1, Texas, 4.
[4] Exclusive of Oklahoma City and Tulsa
[5] Rocky Mountain spotted fever, week ended June 2, 1934, 14 cases, as follows Montana, 5, Idaho, 3, Wyoming, 4, Utah, 1, Oregon, 1

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
March 1934										
Colorado	1	24			1,421		0	151	33	2
April 1934										
Colorado	6	16	4		1,363		0	103	5	2
Iowa	9	39	31		976		0	243	26	0
Mississippi	3	31	2,028	3,702	8,558	362		17	3	14
New Hampshire							1	35	0	
Puerto Rico		53	62	2,112	124		0		0	39

March 1934

	Cases
Colorado:	
Chicken pox	574
Impetigo contagiosa	17
Mumps	571
Septic sore throat	2
Undulant fever	1
Vincent's infection	1
Whooping cough	712

April 1934

	Cases
Chicken pox	
Colorado	452
Iowa	245
Mississippi	606
Puerto Rico	173
Conjunctivitis	
Iowa	6
Dengue	
Mississippi	2
Dysentery	
Colorado	1
Mississippi (amoebic)	44
Puerto Rico	44
Filariasis	
Puerto Rico	3

April 1934—Continued

	Cases
German measles	
Iowa	2,247
Hookworm disease	
Mississippi	256
Impetigo contagiosa	
Colorado	26
Iowa	2
Leprosy.	
Puerto Rico	1
Lethargic encephalitis	
Iowa	1
Mumps	
Colorado	666
Iowa	313
Mississippi	826
Puerto Rico	34
Ophthalmia neonatorum	
Puerto Rico	5
Puerperal septicemia	
Mississippi	11
Puerto Rico	10
Rabies in animals	
Mississippi	1

April 1934—Continued

	Cases
Septic sore throat	
Iowa	1
Tetanus	
Puerto Rico	19
Tetanus, infantile	
Puerto Rico	11
Trachoma	
Mississippi	1
Puerto Rico	65
Trichinosis	
Iowa	3
Tularaemia	
Mississippi	2
Undulant fever	
Colorado	1
Iowa	8
Vincent's infection	
Colorado	90
Iowa	4
Whooping cough	
Colorado	579
Iowa	267
Mississippi	2,315
Puerto Rico	253

PLAGUE-INFECTED GROUND SQUIRRELS IN TULARE COUNTY, CALIF.

The Director of Public Health of California has reported that on May 22, 1934, three ground squirrels from Tulare County, in the interior of California, were found to be plague infected.

WEEKLY REPORTS FROM CITIES

City reports for week ended May 26, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table. Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	1	10	0	0	1	7	19
New Hampshire											
Concord	0	------	0	6	2	1	0	0	0	3	17
Nashua	0	------	------	20	------	0	0	------	0	0	------
Vermont											
Barre	------	------	------	------	------	------	------	------	------	------	------
Burlington	0	------	0	4	0	2	0	0	0	0	10
Massachusetts											
Boston	4	------	1	179	29	53	0	14	2	47	232
Fall River	2	------	0	2	0	3	0	3	0	3	25
Springfield	0	------	0	0	0	1	0	0	0	14	25
Worcester	0	------	0	1	6	16	0	1	0	31	49
Rhode Island											
Pawtucket	0	------	0	3	0	1	0	0	0	0	21
Providence	2	------	0	4	3	14	0	1	0	10	74
Connecticut											
Bridgeport	0	------	0	0	0	17	0	1	0	1	34
Hartford	0	------	0	7	0	12	0	4	0	1	26
New Haven	0	------	0	1	4	1	0	0	0	9	32
New York											
Buffalo	0	------	0	50	26	23	0	10	0	22	166
New York	36	19	9	328	150	306	0	95	2	117	1,541
Rochester	------	------	------	------	------	------	------	------	------	------	------
Syracuse	0	------	0	34	1	13	0	0	0	19	51
New Jersey											
Camden	0	1	0	8	2	7	0	1	0	4	36
Newark	0	4	0	52	6	19	0	6	0	53	105
Trenton	1	------	1	51	0	11	0	4	0	0	36
Pennsylvania											
Philadelphia	8	3	3	311	44	112	0	27	3	42	406
Pittsburgh	12	1	2	268	32	45	0	7	0	20	170
Reading	0	------	0	5	1	3	0	0	0	12	29
Scranton	0	------	------	1	------	2	0	------	0	0	------
Ohio											
Cincinnati	1	------	0	5	9	40	0	12	0	9	115
Cleveland	11	17	3	232	23	127	0	20	1	69	207
Columbus	2	1	1	3	6	58	0	6	0	14	79
Toledo	1	------	0	177	4	50	0	3	0	86	85
Indiana											
Fort Wayne	4	------	0	13	1	6	0	0	0	2	17
Indianapolis	2	------	0	336	11	11	0	2	0	35	------
South Bend	0	------	1	22	2	5	0	1	0	0	14
Terre Haute	0	------	0	0	4	0	0	0	0	2	22
Illinois											
Chicago	10	4	1	773	50	264	0	32	1	134	694
Cicero	------	------	------	------	------	------	------	------	------	------	2
Springfield	1	------	0	45	0	0	0	1	0	14	24
Michigan											
Detroit	5	3	0	149	23	118	0	17	0	118	249
Flint	1	0	1	5	7	69	0	2	0	18	29
Grand Rapids	0	------	0	10	2	25	0	0	0	7	25
Wisconsin											
Kenosha	0	------	0	5	0	7	0	0	0	3	5
Milwaukee	2	------	0	129	3	178	2	3	0	38	89
Racine	0	------	0	3	1	7	0	1	0	4	18
Superior	0	------	0	1	0	0	0	0	1	0	7

City reports for week ended May 26, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Minnesota											1
Duluth	0	-	0	1	3	4	0	0	0	0	19
Minneapolis	1	-	1	12	6	27	0	1	0	25	86
St Paul	0	1	0	6	6	4	0	2	0	25	66
Iowa											
Davenport	0	-	-	7	-	1	0	-	0	0	-
Des Moines	1	-	-	0	-	13	0	-	0	0	33
Sioux City	1	-	-	230	-	0	0	-	0	3	-
Waterloo	0	-	-	0	-	1	0	-	0	2	-
Missouri											
Kansas City	1	-	0	7	7	22	0	7	0	12	97
St Joseph	-	-	-	-	-	-	-	-	-	-	-
St Louis	16	1	0	13	7	22	0	8	0	70	208
North Dakota											
Fargo	0	-	0	10	0	0	0	0	0	22	4
Grand Forks	0	-	-	0	-	1	0	-	0	0	-
South Dakota											
Aberdeen	0	-	-	35	-	0	0	-	0	23	-
Nebraska											
Omaha	1	-	0	52	7	11	4	0	0	5	48
Kansas											
Topeka	1	-	0	48	2	0	0	0	0	25	25
Wichita	0	-	0	30	2	1	0	2	0	10	29
Delaware											
Wilmington	0	-	0	13	0	0	0	0	0	9	-
Maryland											
Baltimore	6	5	0	1,270	17	29	0	11	9	101	216
Cumberland	1	-	0	8	2	1	0	0	0	0	13
Frederick	0	-	0	14	0	0	0	0	0	0	1
Dist of Columbia											
Washington	8	3	3	48	10	12	0	16	0	20	174
Virginia											
Lynchburg	0	-	0	111	2	1	0	0	0	11	13
Norfolk	0	-	0	5	4	0	0	3	1	3	39
Richmond	0	-	1	237	1	1	0	3	0	0	45
Roanoke	0	-	0	2	0	2	0	0	0	6	16
West Virginia											
Charleston	1	-	0	39	1	0	0	1	[1] 4	0	20
Huntington	0	-	-	0	-	2	0	-	0	0	-
Wheeling	0	-	1	9	2	25	0	0	0	6	22
North Carolina											
Raleigh	0	-	0	9	0	0	0	0	0	21	15
Wilmington	0	-	0	10	1	0	0	0	0	8	7
Winston-Salem	0	-	0	2	0	2	0	1	0	11	15
South Carolina											
Charleston	0	2	0	14	1	0	0	2	3	0	16
Columbia	0	-	0	0	2	0	0	0	0	0	14
Greenville	0	-	0	0	2	0	0	0	0	5	8
Georgia											
Atlanta	0	4	0	19	7	2	0	0	2	3	60
Brunswick	0	-	0	7	0	0	0	0	0	0	3
Savannah	1	8	0	16	1	0	0	3	2	2	34
Florida											
Miami	0	-	0	117	0	0	0	2	1	9	25
Tampa	1	1	1	48	0	0	0	0	0	0	26
Kentucky											
Ashland	0	-	-	33	-	0	0	-	1	0	-
Lexington	0	-	0	70	2	1	0	3	0	12	22
Louisville	1	-	0	132	5	18	0	2	0	44	86
Tennessee											
Memphis	1	-	1	17	8	2	0	4	1	5	88
Nashville	0	-	0	2	6	2	0	1	0	1	42
Alabama											
Birmingham	1	1	0	89	0	1	0	2	0	1	52
Mobile	0	-	0	7	1	0	0	0	1	0	20
Montgomery	1	-	-	125	-	0	0	-	0	0	-
Arkansas											
Fort Smith	1	-	-	3	-	0	0	-	0	1	-
Little Rock	0	-	0	0	0	0	0	1	0	4	2
Louisiana											
New Orleans	8	2	2	48	10	8	0	7	2	0	134
Shreveport	0	-	0	4	2	0	0	3	0	4	29

[1] Nonresident

City reports for week ended May 26, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Texas											
Dallas	5	------	0	------	6	4	0	3	0	5	65
Fort Worth	1	------	1	1	1	0	0	2	0	0	45
Galveston	0	------	0	0	0	2	0	0	0	0	13
Houston	4	------	0	1	6	2	1	4	0	0	67
San Antonio	0	------	2	4	6	3	0	3	3	0	68
Montana											
Billings	0	------	0	0	0	0	0	0	0	0	2
Great Falls	0	------	0	3	1	1	0	0	0	0	8
Helena	0	------	0	0	0	0	0	0	0	0	3
Missoula	0	------	0	1	0	0	0	0	0	0	7
Idaho											
Boise	0	------	0	0	1	0	0	0	0	2	6
Colorado											
Denver	4	29	0	607	3	14	0	2	0	51	78
Pueblo	0	------	0	20	2	8	0	0	0	16	9
New Mexico											
Albuquerque	0	------	0	30	2	2	0	3	0	3	12
Utah											
Salt Lake City	0	------	0	14	5	8	11	3	0	115	26
Nevada											
Reno	0	------	0	1	0	0	0	0	0	0	3
Washington											
Seattle	0	------	------	20	4	24	0	3	0	47	72
Spokane	0	------	------	22	2	4	0	1	0	14	23
Tacoma	0	------	1	101	0	1	0	0	0	21	23
Oregon											
Portland	1	1	1	14	5	14	1	3	0	12	73
Salem	0	------	------	0	------	0	0	------	0	0	------
California											
Los Angeles	14	7	1	29	10	43	0	23	0	48	296
Sacramento	2	------	0	5	1	4	0	0	0	1	22
San Francisco	0	1	0	384	1	10	0	13	0	11	135

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Massachusetts			
Boston	0	0	1
Connecticut			
Bridgeport	1	1	0
New York			
New York	2	0	1
New Jersey			
Newark	1	0	0
Pennsylvania:			
Philadelphia	1	1	0
Ohio			
Cincinnati	2	2	0
Indiana:			
Indianapolis	1	0	0
Illinois			
Chicago	7	4	1
Minnesota:			
St. Paul	1	0	0
Iowa:			
Des Moines	1	------	0
Missouri			
Kansas City	1	1	0
St. Louis	2	0	0
Maryland			
Baltimore	2	0	0
West Virginia:			
Wheeling	0	0	1
Kentucky:			
Ashland	1	1	0
Louisiana			
New Orleans	1	0	0
Idaho			
Boise	0	0	1
Washington			
Spokane	0	0	1
Oregon			
Portland	0	0	2
California			
Los Angeles	0	0	51
Sacramento	0	0	[1] 1
San Francisco	0	0	3

[1] Nonresident

Lethargic encephalitis.—Cases New York, 6; Pittsburgh, 1, St Louis, 1, San Francisco, 1.
Pellagra —Cases Chicago, 1; Charleston, S C., 1; Savannah, 4, Memphis, 1, Dallas, 1.
Typhus fever —San Antonio, 1 case

FOREIGN AND INSULAR

CANADA

Ontario Province—Communicable diseases—4 weeks ended April 28, 1934.—The Department of Health of the Province of Ontario, Canada, reports certain communicable diseases for the 4 weeks ended April 28, 1934, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Cerebrospinal meningitis	5	2	Paratyphoid fever	4	
Chicken pox	707	1	Pneumonia		187
Diphtheria	25	2	Poliomyelitis	3	
Dysentery (amoebic)	1		Puerperal septicemia	2	1
Dysentery (bacillary)	5		Scarlet fever	638	6
Erysipelas	24	1	Septic sore throat	5	1
German measles	10		Syphilis	210	1
Gonorrhea	175		Tetanus	2	
Influenza	58	1	Trench mouth	5	
Jaundice	1		Tuberculosis	195	48
Lethargic encephalitis	2	1	Typhoid fever	34	1
Malaria	1		Undulant fever	8	
Measles	272		Whooping cough	1, 199	6
Mumps	952				

Quebec Province—Communicable diseases—2 weeks ended May 19, 1934.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended May 19, 1934, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	1	Measles	610
Chicken pox	123	Ophthalmia neonatorum	2
Diphtheria	25	Poliomyelitis	2
Dysentery (amoebic)	1	Puerperal septicemia	6
Dysentery (bacillary)	47	Scarlet fever	113
Erysipelas	12	Tuberculosis	122
German measles	14	Typhoid fever	32
Influenza	11	Whooping cough	167

CUBA

Habana—Communicable diseases—4 weeks ended May 19, 1934.—During the 4 weeks ended May 19, 1934, certain communicable diseases were reported in Habana, Cuba, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Diphtheria	3		Scarlet fever	2	
Leprosy	2		Tuberculosis	26	14
Malaria	11	1	Typhoid fever	13	1

CZECHOSLOVAKIA

Communicable diseases—March 1934.—During the month of March 1934, certain communicable diseases were reported in Czechoslovakia, as follows:

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	5	1	Paratyphoid fever	4	1
Cerebrospinal meningitis	18	7	Poliomyelitis	3	-------
Chicken pox	259	-------	Puerperal fever	67	30
Diphtheria	2,029	130	Scarlet fever	1,818	27
Dysentery	1	-------	Trachoma	115	-------
Influenza	291	22	Typhoid fever	293	28
Lethargic encephalitis	2	2	Typhus fever	123	5
Malaria	11	-------			

GREAT BRITAIN

Scotland—Vital statistics—Quarter ended March 31, 1934.—The Registrar General of Scotland has published the following vital statistics for Scotland for the first quarter ended March 31, 1934:

Population, estimated	4,936,000	Deaths from—Continued	
Births	22,740	Heart disease	2,963
Birth rate per 1,000 population	18 7	Influenza	220
Deaths	17,406	Lethargic encephalitis	16
Death rate per 1,000 population	14 3	Measles	89
Deaths under 1 year	2,099	Nephritis, acute	66
Deaths under 1 year per 1,000 births	92	Nephritis, chronic	311
Marriages	7,695	Nephritis, unspecified	125
Deaths from		Paratyphoid fever	2
Appendicitis	113	Pneumonia (lobar)	443
Bronchitis	915	Pneumonia, unspecified	232
Broncho-pneumonia	896	Poliomyelitis	2
Cancer	1,829	Puerperal sepsis	64
Cerebrospinal fever	54	Scarlet fever	125
Diabetes	213	Syphilis	25
Diarrhea and enteritis (under 2 years)	121	Tetanus	4
Diphtheria	173	Tuberculosis	1,000
Dysentery	10	Typhoid fever	4
Erysipelas	74	Whooping cough	78

ITALY

Communicable diseases—4 weeks ended December 10, 1933.—During the 4 weeks ended December 10, 1933, cases of certain communicable diseases were reported in Italy, as follows:

Disease	Nov 13-19		Nov 20-26		Nov. 27-Dec. 3		Dec. 4-10	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	16	16	26	24	21	18	20	16
Cerebrospinal meningitis	10	10	10	10	8	7	4	4
Chicken pox	171	85	235	104	281	97	301	118
Diphtheria and croup	759	385	774	409	836	417	751	370
Dysentery	12	8	20	11	6	4	10	7
Lethargic encephalitis	-------	-------	-------	-------	3	3	-------	-------
Measles	1,455	218	1,477	238	1,192	206	1,429	205
Poliomyelitis	8	8	8	8	7	6	2	2
Scarlet fever	467	195	481	215	450	191	373	155
Typhoid fever	635	326	571	316	464	247	324	205

JAMAICA

Communicable diseases—4 weeks ended May 19, 1934.—During the 4 weeks ended May 19, 1934, cases of certain communicable diseases were reported in Kingston, Jamaica, and in the island outside of Kingston, as follows

Disease	Kingston	Other localities	Disease	Kingston	Other localities
Chicken pox	2	32	Leprosy		3
Diphtheria	1		Puerperal fever		4
Dysentery	5	13	Tuberculosis	33	84
Erysipelas	1	2	Typhoid fever	25	67

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for May 25, 1934, pp 636–648 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued June 29, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands—No cholera was reported in the Philippine Islands for the week ended June 2, 1934

Plague

United States—California—A report of plague-infected ground squirrels in Tulare County, in the interior of the State of California, appears on page 716 of this issue of PUBLIC HEALTH REPORTS

Smallpox

Mexico—Coahuila—Rosita—A report dated May 23, 1934, states that 11 cases of smallpox were reported on this date at Rosita, Coahuila, Mexico, in the Mexican camp connected with the American Smelting & Refining Co 's mine Vaccination has been made compulsory for all the inhabitants.

Yellow Fever

Ivory Coast—Rubino—During the week ended May 26, 1934, 2 cases of yellow fever with 2 deaths were reported in Rubino, Ivory Coast.

Senegal—Matam—A report dated May 23, 1934, states that 1 case of yellow fever with 1 death was reported in Matam, Senegal.

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Cerebrospinal meningitis	10	10	10	10	8	7	4	4
Chicken pox	171	85	235	104	281	97	301	118
Diphtheria and croup	759	385	774	409	836	417	751	370
Dysentery	12	8	20	11	6	4	10	7
Lethargic encephalitis					3	3		
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Poliomyelitis	8	8	8	8	7	6	2	2
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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 25

JUNE 22 - - - - 1934

IN THIS ISSUE

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Effect of Inhaled Marble Dust on Vermont Marble Finishers
Tests of Pellagra-Preventive Value of Certain Foodstuffs
Deaths in Large Cities During the Week Ended June 2, 1934
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D C. - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S. CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law. United States Code, title 42, sections 7, 30, 93; title 44, section 220.

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health.

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CONTENTS

Page

Endemic typhus fever—Susceptibility of woodchucks, house mice, meadow mice, and white-footed mice ... 723
Effect of inhaled marble dust as observed in Vermont marble finishers ... 724
The pellagra-preventive value of green onions, lettuce leaves, pork shoulder and peanut meal ... 732
Court decision on public health ... 736
Deaths during week ended June 2, 1934
Deaths and death rates for a group of large cities in the United States ... 737
Death claims reported by insurance companies ... 737

PREVALENCE OF DISEASE

United States:
Current weekly State reports
Reports for weeks ended June 9, 1934, and June 10, 1933 ... 738
Summary of monthly reports from States ... 740
Cases of venereal diseases reported for April 1934 ... 741
Weekly reports from cities
City reports for week ended June 2, 1934 ... 743
Foreign and insular:
Canada—
Provinces—Communicable diseases—2 weeks ended May 19, 1934 ... 746
Quebec Province—Communicable diseases—2 weeks ended June 2, 1934 ... 746
France—Vital statistics—1932, 1933 ... 747
Yugoslavia—Communicable diseases—April 1934 ... 747
Cholera, plague, smallpox, typhus fever, and yellow fever—
Cholera ... 747
Typhus fever ... 747

PUBLIC HEALTH REPORTS

VOL. 49 JUNE 22, 1934 NO. 25

ENDEMIC TYPHUS FEVER

Susceptibility of Woodchucks, House Mice, Meadow Mice, and White-footed Mice

By R E DYER, *Surgeon, United States Public Health Service*

The role played by the rat in endemic typhus has been well established in the past few years, and the possibility of the existence of a reservoir of the disease in other rodents in nature must be considered. In view of this, it seemed advisable to determine what native wild rodents are susceptible to endemic typhus virus

To date we have found that four species of wild rodents, namely, woodchucks, house mice, meadow mice, and white-footed mice, are susceptible. For these experiments the rodents were either trapped by ourselves or procured from the Bureau of Entomology, Department of Agriculture, through the courtesy of Dr. F. C Bishopp and Mr. Carroll Smith All the rodents used were trapped in regions where no cases of endemic typhus have been reported in man.

In determining the susceptibility of these animals, the individual rodents were inoculated with endemic typhus virus of the Wilmington strain. Testicular washings from guinea pigs were used as the source of virus in each instance. The virus was subsequently recovered from the wild rodents from 4 to 10 days after inoculation In the case of the mice, these animals were killed and their spleens and brains utilized as sources of virus. The woodchucks were bled from the heart. Each strain of virus recovered from these rodents (mice and woodchucks) was studied in a sufficient number of guinea pigs and rabbits to determine its identity by the clinical reactions, the production of agglutinins for *B. proteus* X_{19}, the presence of typical brain lesions, and cross immunity with known typhus virus.

REACTION IN WOODCHUCKS

Two woodchucks (*Marmota monax monax*), approximately three-fourths grown, were inoculated with endemic typhus virus One of these animals showed no febrile reaction subsequent to inoculation,

while the second developed a febrile reaction beginning 5 days after inoculation and continuing 6 days Neither animal appeared sick at any time Virus was recovered only from the woodchuck showing the febrile reaction.

REACTION IN MICE

Two house mice (*Mus musculus musculus*), 5 meadow mice (*Microtus pennsylvanicus pennsylvanicus*), and 2 white-footed mice (*Peromyscus leucopas noveboracensis*) were inoculated with endemic typhus virus. No temperatures were taken on these mice. The house mice showed no signs of illness, remaining lively until killed. All of the meadow mice showed loss of appetite, roughing of the fur and listlessness, beginning 2 days after inoculation. Four of these mice died on the fourth day after inoculation. The fifth was killed on the following day

The white-footed mice showed some roughing of the fur, lack of appetite, and some sluggishness on the third day following inoculation. Both of these mice were killed for recovery of the virus, one on the fourth and the other on the sixth day after inoculation.

SUMMARY

Woodchucks, house mice, meadow mice, and white-footed mice were found susceptible to endemic typhus fever.

EFFECT OF INHALED MARBLE DUST AS OBSERVED IN VERMONT MARBLE FINISHERS

By WALDEMAR C. DREESSEN, *Passed Assistant Surgeon, United States Public Health Service*

The pulmonary fibrotic changes due to the inhalation of marble dust appear to be slight in comparison with those caused by stone dust containing a high percentage of silica in the form of quartz. This difference has been suggested statistically, clinically, and experimentally. The present paper briefly reviews the literature having a direct bearing on this subject, and presents certain observations on workers in an industrial plant in Vermont, where marble is finished for market.

BRIEF REVIEW OF THE LITERATURE

Mineral dusts composed of calcium have been pointed out by Hoffman (1) as being the least injurious of the inorganic mineral dusts. Although general mortality statistics distinguishing marble- and granite-cutters were not available, Hoffman (2), on the basis of various local observations stated that "the evidence [statistical] is conclusive that workers exposed to marble or limestone dust suffer

a decidedly lesser liability to pulmonary tuberculosis than those exposed to granite or sandstone dust, with a high silicotic content "

Bianchi (3) (Italy) examined 250 marble finishers, both clinically and radiographically, and supplemented his study with experimental dusting of rabbits. The lesions he saw in the roentgenograms of the workers were accentuated in proportion to the time of exposure, but did not lead to functional disturbance except in a few cases where inherent constitutional factors could not be ruled out He was of the opinion that marble dust inhaled by such workers caused "anatomopathological lesions characterized by diffuse foci of peribronchitis and interstitial pneumonia "

On the basis of clinical and roentgenological examinations of 105 marble workers, a large proportion of whom were given sputum analyses, Turano (4) (Carrara, Italy) did not feel that the lime dust had a marked tendency to localize and accumulate in the pulmonary tissues, although in 28 percent he found definite arborescent markings which corresponded to what he had always regarded as the initial stage of pneumoconiosis Five of the cases showed atypical tuberculosis

Mazzitelli (5), in a statistical study of the causes of death of the population of Carrara, Italy, observed that the tuberculosis mortality figures were very low among marble workers in that community He also injected dust suspensions of white marble, colored marbles, and marble and granite mixtures into the lungs of guinea pigs. His findings indicated that white marble, which was almost pure carbonate of lime, was apparently absorbed and eliminated from the lungs and therefore produced only slight reaction in the pulmonary tissues. The other dusts, however, induced more pronounced changes.

Loriga (6) commented on the interesting controversy regarding the pathology caused by marble dust in Italy when he discussed "Pneumonoconiosis in Italy" at the International Silicosis Conference at Johannesburg, South Africa, in 1930 This controversy mainly involved the question as to whether marble-dusted lungs were more susceptible to tuberculous infection.

Gardner and Dworski (7), in a series of experiments wherein guinea pigs were exposed to marble dust, concluded that "inhaled marble dust is soluble in the lung tissue; that the inhalation of the dust during the process of a preexisting tuberculosis will be followed by the calcification of a certain number of the pulmonary and tracheobronchial lymph node tubercles; that the insoluble siliceous matter found in the dust will produce a moderate degree of silicosis after prolonged exposure; that this silicosis will in turn render the pulmonary tissues in some unexplained manner more susceptible to infection with the tubercle bacillus; and that the tubercles produced by the low virulent

R-1 strain will, as a result of this silicosis, pursue a chronic course manifesting a definite delay in the resolution process "

Pancoast and Pendergrass (8) regard marble dust as not dangerous and the resultant fibrosis following its inhalation as never reaching the advanced stage seen in chests of persons who have inhaled rock dust with a high quartz content over a long period of time.

Rogers (9), who has been engaged in the care and treatment of the tuberculous in the marble- and granite-producing area of Vermont for 19 years, recently stated that it was his belief that the inhalation of marble dust did not predispose to tuberculosis.

In observing the reaction of peritoneal tissues to injected calcite dust, Miller and Sayers (10) noted that nodules, formed after the initial foreign-body reaction, progressively became smaller and eventually disappeared without scar formation. For the sake of description they termed this response as one of absorption

NATURE OF MARBLE DUST

Most Vermont marble deposits occur in beds or layers, each of which has its own individuality in color and other characteristics. Because of these differences, individual beds, are, as a rule, quarried separately, but even so, marble is less complex than almost any other stone It is almost pure carbonate of lime in the form of the mineral, calcite. The results of a chemical and mineralogical analysis of Vermont marble, made for the United States Public Health Service by Prof. Adolph Knopf of Yale University, are given in table 1.

TABLE 1 —*Chemical and mineralogical analysis of Vermont marble*

Constituent	Chemical analysis	Constituent	Mineralogical analysis
	Percent		*Percent*
Carbonates	99.174	Calcite ($CaCO_3$)	98
Manganese and aluminum oxides	.005	Dolomite	2
Insolubles	.630		
Organic matter	.080		
Total	99.889		100

Foreign varieties of marble have a somewhat different composition; in fact, verde antique, a so-called "marble" used frequently in interior finishing, is really a form of precious serpentine (11) (a magnesium silicate) No original data are at hand pertaining to the chemical and mineralogical analyses of the foreign varieties of marble and of verde antique.

In the description of the plant processes which follows, it will be observed that sand is used for abrasive purposes in certain operations. For this reason, two samples of settled dust were collected and examined for quartz content. One sample, taken in the vicinity of workers not using sand, showed no quartz; while a sample taken near the rub-

bing-bed operators disclosed a quartz content of 10 percent, and 90 percent carbonates

A study of the particle size of the dust in the air of the plant (12) showed that only 12 percent of the measured particles were less than 1 micron, 70 percent were less than 2 microns; and none exceeded 6 microns The median size of this dust was 1.5 microns.

BRIEF DESCRIPTION OF MARBLE QUARRYING AND FINISHING PROCESSES

Although this paper is concerned with the finishing mills, it is not out of place to give a brief description of the quarry methods in addition to the processes in the mill proper, because this antecedent operation in a way governs the manner in which the stone is finished In quarrying marble, holes are drilled around block-shaped masses of the stone with electrically driven channeling machines, or Leyner drills, the blocks being wedged out by the use of pegs. Dynamiting is not resorted to, because it mars the stone. The quarried blocks are then taken to the sawing mills, where they are cut to size with large gang saws. When they have been sawed down to a workable size, they are ready to be taken to the finishing mills, of which there are three types (exterior, interior, and monumental)

Unless the block or slab has been cut to approximate size at the sawmill, the slabs are split or sawed with the diamond saw at the finishing mill. "Thin stock" is the term applied to marble of a thickness of ⅞ of an inch to 2 inches, depending on the way it is used in building The stock comes to the shop in the form of full-sized slabs. These are first "coped" (i.e., edges trimmed) either by hand or on carborundum machines When done by hand, this operation is accomplished partly by pneumatic tools and partly by hand pointing.

Interior marble which is more than 2 inches thick is known as "cubic " This is usually sawed to approximate size in the sawmill, but at times it is worked up from the slab by the use of the diamond saw, carborundum machine, or planer In the carborundum machine the marble moves on a platform under revolving abrasive wheels, while in the planer it moves under stationary chisels. After the slabs or blocks have been shaped to approximate size in one of the ways here indicated, they are taken to the rubbing bed.

The rubbing bed is a large, horizontal iron plate which is propelled like a top at a rate of about 40 revolutions per minute. Water charged with sand flows from the center over the flat upper surface of the disk, and, as pieces of marble are held thereon in a fixed position, the abrasive action wears away the stone to the desired size. In this manner the pieces of marble are squared, and all scratches and scars are removed. While moldings may be cut with the carborundum machine, the planer is better adapted to exterior marble and is therefore used more frequently. Before going to the planer, however, the

marble is "set in" by the cutter, i.e., the mold is cut by hand about an inch at each end of the piece. Turned work is done on a lathe similar to the manner in which wood and metal are fashioned. If the column is fluted, this is accomplished on a planer or carborundum machine. After leaving the rubbing beds and planers, the marble is ready to have the surfaces finished, which is largely done by the polishers.

The polishing machine consists of a movable arm, at the end of which there is a rapidly revolving, horizontal, abrasive disk. The marble is placed on a "banker" under the disk. Various disks are used from a medium carborundum to a fine hone, depending on the degree of abrasive action desired. The final polish is attained by applying a felt-buffer with a polishing powder. Polishing machines are used almost exclusively for the faces of slabs. Although machines are designed for polishing edges, most of this work is done by hand. The process is the same, however, whether by hand or machine.

Pneumatic tools are used chiefly for carved work. For the finer details of this work it is sometimes necessary to resort to the older method of hammer and chisel. It should be borne in mind, however, that the copers also use the pneumatic tool. The final finish usually given to marble is "sand", "tooled", or "axed." The sand finish is obtained by rubbing wet sand on the marble by hand with a block of metal. Tooled and axed finishes are applied by the stone cutters.

OCCUPATIONAL DUST EXPOSURE

Twenty percent of the workers were examined in the present study. The basis of selection was to secure as large a percentage as possible in the groups with greater dust exposure and with longer periods of employment. Within these groups, however, the workers examined are believed to be representative of those in the plant studied. The classification by occupation of the total number of workers and of those examined, together with their respective dust exposures (13), is shown in table 2.

Of the total plant personnel (422), 142 (34 percent) used pneumatic tools. The cutters and carvers were exposed to an average of about 26 million particles per cubic foot of air, a concentration which would be likely to lead to disabling results were the dust high in quartz content.

Three cutters with previous exposure to siliceous dust have been omitted from the analysis.

There was little shifting from occupation to occupation in the group classified as cutters and carvers. Aside from the pneumatic-tool users, shifting of this character did occur, but was usually from occupation to occupation within the industry. Some of these persons used abrasives in their work, a point which is discussed elsewhere in the text.

TABLE 2.—*Occupational distribution of total number of workers and of those examined and their respective dust exposure*

Occupation	Total number in occupation	Examined		Dust count (millions of particles per cubic foot of air)			Number of dust samples
		Number	Percent of total	Average	Maximum	Minimum	
Cutters and carvers	113	38	34	25.9	56.0	9.4	9
Tracers, letterers, and copers	29	5	17	3.7	5.5	2.3	6
Polishers, rubbing-bedmen, and cranemen	114	23	20	2.3	4.6	.6	22
All others [1]	166	17	10				
Total	422	83	20				37

[1] Such as lathe turners, electric truck drivers, shop mechanics, clerks, janitors

CLINICO-ROENTGENOGRAPHIC FINDINGS

Eighty marble finishers were X-rayed and given careful clinical examinations, with particular attention to the chest.[1]

No significant findings were encountered in the anatomical and physiological measurements or in the physical examinations of the chest.

The roentgenographic study offered the most tangible means of measuring *in vivo* pulmonary fibrotic changes. The 80 radiograms were interpreted independently of the clinical histories. In recording the changes observed in the X-rays, the designation "commencing generalized fibrosis"[2] signified a condition in which the markings simulated those seen in the first stage of pneumonoconiosis of the American classification, but were finer and less pronounced. Except for being less in degree, this fibrosis resembled that termed early pneumonoconiosis in the previously reported study of cement workers (14). It was characterized by a fine bilateral, linear, radiating fibrosis confined chiefly to the lower two thirds of the lung fields, and was frequently more pronounced in the lower right. The hilar shadows were moderately increased in size and density. The length of exposure to marble dust necessary to produce even this picture was found to be considerably longer than that required to produce like changes in the cement workers. The X-rays did not show disseminated nodular or conglomerate areas of radiopacity so frequently observed in the chest X-rays of individuals who have inhaled large quantities of dust with a high quartz content.

Still less marked fibrotic changes seen in the X-rays were termed "usual fibrosis" (of a type classified as "more fibrosis than usual" in

[1] Three records omitted because of previous exposure. Fourteen others were examined, but are omitted from the comparisons either because an X-ray was not obtained of the case, or because technically imperfect films did not permit an interpretation of the radiograms.

[2] Owing to the comparatively minor fibrotic changes observed in these X-rays, no prints are being reproduced herein. The reader is referred to other publications on dust by the Public Health Service which illustrate these radiographic changes. (See references 14 and 15.)

previous publications of this office (16)). While this degree of fibrosis may be due partly to dust, and in most cases its distribution was bilaterally symmetrical and directed toward the bases, it also bears some resemblance to that seen in cases of chronic bronchitis, asthma, and old healed infections

X-ray findings are presented in summary in table 3 It is observed that 12 (15 percent of the 80 X-rayed) showed "commencing generalized fibrosis" Although this condition is to be regarded, on the average, as a result of dust exposure in this industry, it was minor in degree, was associated with no disability, and is to be regarded as essentially negative It may also be mentioned that active pulmonary tuberculosis was not demonstrated clinically or radiographically in any of the workers examined

Because of the small numbers and the fact that some of the workers who were not cutters were apparently exposed to dust with a possibly higher percentage of free silica than the cutters, no tabulation of the X-ray findings by occupation is presented. Taking the group of finishers as a whole, it is noted from table 3 that even the minor degree represented by commencing generalized fibrosis does not appear until after many years of exposure to the inhalation of marble dust of the quantity and nature found in this study. The percentage of X-rays classified as showing commencing generalized fibrosis was 3.1 for less than 20 years of exposure, 18.9 for 20 to 39 years of exposure, and 36.4 for 40 years and more

The low concentrations of dust and its comparatively low quartz content probably explain the absence of more advanced pulmonary changes. It is felt that the relatively dust-free conditions in the plant were in a large measure due to modern housing of the machinery proper and the substitution of modern cutting machinery with wet methods for reducing the level of the dust concentration.

TABLE 3.—*X-ray interpretation in relation to period of employment*

Roentgenographic diagnosis	Number of persons by years of employment					Total number
	Less than 10 years	10-19 years	20-29 years	30-39 years	40 years and more	
Commencing generalized fibrosis		1	4	3	4	12
Usual fibrosis [1]	20	11	14	16	7	68
Total	20	12	18	19	11	80

[1] Includes normal chests

SUMMARY AND CONCLUSION

The clinico-roentgenographic findings in 80 marble finishers from a typical plant in Vermont have been studied to determine the effects of inhaling marble dust. Observations of the dust content of the air at the breathing level and analyses of the dust have been recorded.

Although marble dust when inhaled in the concentrations here observed produces a mild bilateral, linear fibrosis in a certain number of cases (termed herein "commencing generalized fibrosis"), no serious lung changes were noted, and there was no disability due to the dust, even after many years of exposure The findings of this study are therefore to be regarded as essentially negative

ACKNOWLEDGMENT

This study was conducted under the direct supervision of Surg. Albert E. Russell, to whom grateful appreciation for guidance and suggestions is hereby acknowledged.

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THE PELLAGRA-PREVENTIVE VALUE OF GREEN ONIONS, LETTUCE LEAVES, PORK SHOULDER, AND PEANUT MEAL

By G A WHEELER, *Surgeon*, and D J HUNT, *Passed Assistant Surgeon, United States Public Health Service*

The studies here reported were carried out at the Milledgeville State Hospital. As in experiments previously reported from this station (1, 2, 3, 4), the studies have been directed toward the determination of the pellagra-preventive value of various foodstuffs. The foods under test were used as supplements to a basic diet believed to be physiologically complete except for a deficiency of the pellagra-preventive factor When used alone this basic diet leads to the production of pellagra within from 3 to 6 months. Any considerable prolongation of this period is regarded as being brought about by the pellagra-preventive action of the supplementary food. Each experimental feeding was continued for 1 year, unless the development of a sufficient number of cases of pellagra caused an earlier termination

In order to insure a continuous supply of green onions and lettuce leaves, it was necessary to have the products canned, since the feeding tests extended over a period when the fresh vegetables were not available. The pellagra-preventive factor does not appear to be appreciably affected by the heat of the canning process.

GREEN ONIONS

Canned immature, green onions were used. The entire onion (including the top) was canned before appreciable development of the bulbous portion. The daily ration for each patient was 502 grams, including the can liquor. The approximate composition of the onion-supplemented diet is shown in table 1.

A group of 14 colored females was placed on this diet. Of this number, 2 developed pellagra during the eighth month, and 7 during the ninth month. The experiment was terminated after the ninth month.

Inasmuch as all of the group would have developed pellagra within about 6 months on the basic diet alone (5), the prolongation of the time of development of pellagra shows that the canned green onions have some slight protective value.

In a previous report (2) it was shown that mature onions have little or no protective value against pellagra. From the results obtained in the present experiment, it would seem that young green onions offer some slight additional protection to that afforded by the mature vegetable.

TABLE 1.—*Basic diet plus canned green onio*

[Total calories, 2,229]

Article of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
BASIC	*Grams*	*Grams*	*Grams*	*Grams*
Cornmeal	328	27 55	15 41	242 72
Cowpeas (California black-eyed)	42	8 98	60	25 50
Wheat flour	21	2 40	20	15 80
Baker's bread	56	5 20	60	29 50
Lard	42		42 00	
Cod-liver oil	14		14 00	
Tomato juice	127			
Calcium carbonate	3			
Dilute hydrochloric acid (U S P)	[1] 90			
Sirup iodide of iron	[1] 2			
SUPPLEMENTAL				
Onions (canned, green)	502	7 50	50	27 10
Total nutrients		51 63	73 31	340.62

[1] Drops

LETTUCE

The lettuce canned for this experiment consisted largely of the green leaves of the Cos or Romaine variety The daily ration for each patient was 516 grams, including the can liquor, as a supplement to the basic diet as shown in table 2.

Of 14 colored females placed on this lettuce-supplemented diet, 2 developed pellagra during the eighth month, and 6 developed pellagra during the ninth month, after which the test was terminated.

Since pellagra would have occurred in the group prior to the sixth month on the basic diet alone, the canned lettuce slightly delayed the onset of the disease It is therefore evident that the canned lettuce leaves offer some slight protective value.

TABLE 2 —*Basic diet plus canned green lettuce*

[Total calories, 2,201]

Article of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
BASIC	*Grams*	*Grams*	*Grams*	*Grams*
Cornmeal	328	27 55	15 41	242 72
Cowpeas (California black-eyed)	42	8 98	60	25 50
Wheat flour	21	2 10	20	15 80
Baker's bread	56	5 20	60	29 50
Lard	42		42 00	
Cod-liver oil	14		14 00	
Tomato juice	127			
Calcium carbonate	3			
Dilute hydrochloric acid (U S P)	[1] 90			
Sirup iodide of iron	[1] 2			
SUPPLEMENTAL				
Lettuce (canned, green)	516	7 70	2 0	16 50
Total nutrients		51 83	74 81	330 02

[1] Drops.

PORK SHOULDER

The pork shoulder used in this experiment was purchased on the open market and was the smoked product of a well-known brand. It was cooked in a steam cooker until done The fat was then removed as completely as possible and the remainder was ground. The amount fed to each patient as a supplement to the basic diet was 200 grams of the lean cooked meat. This diet is shown in table 3.

Sixteen white females were used in this test. Of this number, 11 were under observation for a period of 1 year; 1 for 11 months. None of the 16 individuals developed pellagra

Since pellagra would have developed on the basic diet alone within about 6 months, lean pork shoulder must be regarded as a good source of the pellagra-preventive factor.

TABLE 3.—*Basic diet plus pork shoulder*

[Total calories, 1,892]

Article of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
BASIC	*Grams*	*Grams*	*Grams*	*Grams*
Cornmeal	270	22 7	12.7	199 8
Cowpeas (California black-eyed)	42	8 98	6	25 5
Wheat flour	21	2 4	.2	15 8
Lard	21		21 0	
Cod-liver oil	14		14.0	
Tomato juice	127			
Calcium carbonate	3			
Dilute hydrochloric acid (U S P)	[1] 90			
Sirup iodide of iron	[1] 2			
SUPPLEMENTAL				
Pork shoulder	200	34.50	24.14	
Total nutrients		68.58	72 64	241.1

[1] Drops.

PEANUT MEAL

The peanut meal used in this test was a commercial peanut meal. It was cooked thoroughly in a steam cooker and fed as a supplement to the basic diet in the amount of 200 grams daily per patient. This diet is shown in table 4

Sixteen white females were used in this test Twelve of these were under observation throughout an entire year None of them developed any signs of pellagra

Since pellagra would have occurred on the basic diet alone within about 6 months, it is obvious that the peanut meal in the quantity used contained sufficient of the pellagra-preventive factor to protect this group over a period of 1 year

In comparison with other substances tested, it must therefore be regarded as a good source of the pellagra-preventive factor.

This result is in agreement with the findings of Wheeler and Sebrell (6), who studied the preventive potency of peanut meal in blacktongue in dogs (canine pellagra).

TABLE 4 —*Basic diet plus peanut meal*

[Total calories, 2,336]

Article of diet	Quantity	Nutrients		
		Protein	Fat	Carbohydrate
BASIC	*Grams*	*Grams*	*Grams*	*Grams*
Cornmeal	270	22.7	12 7	199 8
Cowpeas (California black-eyed)	42	8 98	.6	25.5
Wheat flour	21	2.4	2	15 8
Lard	21		21.0	
Cod-liver oil	14		14 0	
Tomato juice	127			
Calcium carbonate	3			
Dilute hydrochloric acid (U S P)	90 [1]			
Sirup iodide of iron	2 [1]			
SUPPLEMENTAL				
Peanut meal (ground)	200	83.6	16 7	78 6
Total nutrients		117.68	65 2	319.7

[1] Drops

CONCLUSIONS

1. Canned green onions contain the pellagra-preventive factor, but in small amount.
2. Canned lettuce leaves are poor in the pellagra-preventive factor.
3. Lean pork shoulder is a good source of the pellagra-preventive factor.
4. Peanut meal is a good source of the pellagra-preventive factor.

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COURT DECISION ON PUBLIC HEALTH

State held to possess power to fix selling price of milk.—(U S. Supreme Court; *Nebbia* v *People of State of New York*, 54 S. Ct. 505; decided Mar. 5, 1934.) By Laws 1933, chapter 158, the New York Legislature established a milk-control board which was empowered among other things to "fix minimum and maximum * * * retail prices to be charged by * * * stores to consumers for consumption off the premises where sold." Nine cents was fixed by the board as the price to be charged by a store for a quart of milk. A grocery store proprietor was convicted of violating the milk-control board's order because he sold 2 quarts of milk and a 5-cent loaf of bread for 18 cents. The conviction was affirmed by the New York Court of Appeals [1] and the case was carried to the United States Supreme Court.

The claim was made on behalf of the appellant that the statute and the board's order contravened the equal protection clause and due process clause of the 14th amendment to the Federal Constitution, and the Supreme Court said that the question for decision was whether the Constitution prohibited a State from so fixing the selling price of milk. The view was taken by the majority of the court that the appellant was denied neither the equal protection of the laws nor due process of law.

[1] See Public Health Reports for July 28, 1933, pp 884–887.

In the course of the majority opinion the history of the legislation was reviewed and some of the conclusions of the legislative committee which had investigated the milk situation in the State prior to the enactment of the milk control law were recited as follows

Milk is an essential item of diet It cannot long be stored It is an excellent medium for growth of bacteria These facts necessitate safeguards in its production and handling for human consumption which greatly increase the cost of the business Failure of producers to receive a reasonable return for their labor and investment over an extended period threaten a relaxation of vigilance against contamination

DEATHS DURING WEEK ENDED JUNE 2, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended June 2, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	8,034	7,194
Deaths per 1,000 population, annual basis	11 2	10 0
Deaths under 1 year of age	584	491
Deaths under 1 year of age per 1,000 estimated live births	54	[1] 41
Deaths per 1,000 population, annual basis, first 22 weeks of year	12 3	11 7
Data from industrial insurance companies		
Policies in force	67,823,174	67,920,937
Number of death claims	11,196	10,313
Death claims per 1,000 policies in force, annual rate	8 6	7 9
Death claims per 1,000 policies, first 22 weeks of year, annual rate	10 8	10 6

[1] Data for 81 cities

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, were, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended June 9, 1934, and June 10, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 9, 1934, and June 10, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933
New England States								
Maine		2		3	28	2	0	1
New Hampshire					100	15	0	0
Vermont	1				65	63	0	0
Massachusetts	9	24			980	613	0	0
Rhode Island		5			32	3	0	0
Connecticut	4	2	1	1	260	191	2	0
Middle Atlantic States								
New York	55	44	[1] 4	[1] 4	1,387	1,785	5	4
New Jersey	17	20	11	1	746	984	2	0
Pennsylvania	54	39			2,637	1,165	0	5
East North Central States								
Ohio	19	22	4		925	417	1	1
Indiana	17	7		12	626	141	0	3
Illinois	39	19	8	19	2,414	545	4	8
Michigan	6	31	3	2	356	670	2	1
Wisconsin	1	5	23	16	2,095	153	2	2
West North Central States								
Minnesota	3	6	3	2	167	190	0	1
Iowa [2]	7	6			263	66	0	1
Missouri	35	18	12		117	164	2	2
North Dakota	5	3			45	69	0	0
South Dakota	2	1			131	19	0	0
Nebraska	9	6			119	194	0	1
Kansas	9	11	1		454	171	0	0
South Atlantic States								
Delaware	2				56	11	0	0
Maryland [2,3,4]	8	9	3	3	866	33	0	1
District of Columbia	6	1	2	1	21	22	1	1
Virginia [3]	9	9			955	224	0	0
West Virginia	11	3	15	3	143	110	1	1
North Carolina	13	12	14	10	969	419	2	0
South Carolina	3	7	100	98	119	278	0	0
Georgia [3]	1	4			121	352	0	1
Florida [3]	9	2	1	1	155	28	0	0

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 9, 1934, and June 10, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933
East South Central States								
Kentucky	11	1	5	9	293	32	0	1
Tennessee	6	3	11	15	250	48	3	2
Alabama [3]	8	12	7	3	238	34	1	2
Mississippi [2]	3	10					1	0
West South Central States								
Arkansas	6	3	17	1	27	83	1	0
Louisiana	11	8	7	10	175	22	1	0
Oklahoma [5]	5	5	21	8	71	73	0	0
Texas [3]	46	45	142	144	875	550	0	4
Mountain States								
Montana [4]	1	1	2	1	48	18	0	0
Idaho [4]				2	10	6	0	0
Wyoming [4]					111	9	0	0
Colorado	14	2			544	6	0	0
New Mexico	1	6			49	14	1	0
Arizona	2	1			7	77	0	0
Utah [2]	3	1			27	49	0	0
Pacific States								
Washington		3	1		283		0	0
Oregon [4]	1	1	21	26	34	41	0	0
California	16	29	26	26	879	1,274	1	5
Total	488	449	465	421	21,273	11,433	33	48

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933
New England States								
Maine	0	0	16	10	0	0	8	4
New Hampshire	0	0	2	13	0	0	1	0
Vermont	0	0	16	6	0	0	0	0
Massachusetts	1	1	179	255	0	0	2	4
Rhode Island	0	0	8	24	0	0	1	0
Connecticut	0	0	31	62	0	0	0	1
Middle Atlantic States								
New York	3	0	616	485	0	0	10	20
New Jersey	0	0	146	133	0	0	10	5
Pennsylvania	0	2	496	458	0	0	11	25
East North Central States								
Ohio	0	1	416	448	1	0	7	9
Indiana	0	1	71	45	2	1	9	7
Illinois	2	1	415	288	0	7	8	10
Michigan	2	3	438	361	2	0	10	4
Wisconsin	0	0	217	86	15	16	3	1
West North Central States								
Minnesota	0	1	66	42	4	0	0	0
Iowa [2]	0	0	39	15	1	14	0	4
Missouri	0	0	40	31	0	0	17	5
North Dakota	0	0	14	7	1	0	0	0
South Dakota	0	0	2	3	0	0	0	0
Nebraska	0	1	21	12	1	1	1	0
Kansas	0	0	20	26	1	0	7	5
South Atlantic States:								
Delaware	0	0	2	5	0	0	1	0
Maryland [2 3 4]	0	0	31	58	0	0	3	9
District of Columbia	0	0	7	8	0	0	0	1
Virginia [3]	0	0	14	27	1	0	8	9
West Virginia	0	0	64	18	0	2	10	4
North Carolina	0	0	11	28	0	1	1	12
South Carolina	0	0	2	6	0	0	9	30
Georgia [3]	4	0	1	4	1	0	24	36
Florida [3]	0	0	1	1	0	0	1	3

See footnote at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 9, 1934, and June 10, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933	Week ended June 9, 1934	Week ended June 10, 1933
East South Central States								
Kentucky	2	0	37	9	1	0	14	13
Tennessee	0	1	8	16	0	1	4	14
Alabama [3]	0	0	4	17	1	0	8	16
Mississippi [2]	2	1	5	4	0	0	6	8
West South Central States								
Arkansas	0	0	2	------	0	8	3	9
Louisiana	0	0	8	5	0	0	11	20
Oklahoma [5]	0	0	6	7	1	3	4	12
Texas [3]	1	0	33	45	28	7	31	36
Mountain States								
Montana [4]	0	0	6	17	0	0	1	0
Idaho [4]	0	0	6	3	0	1	0	0
Wyoming [4]	0	0	1	6	8	0	0	1
Colorado	2	0	10	23	5	6	2	1
New Mexico	0	0	4	1	0	0	3	2
Arizona	1	0	7	9	0	0	5	1
Utah [2]	0	0	4	6	0	0	0	0
Pacific States								
Washington	0	1	50	27	4	13	3	2
Oregon [4]	1	0	22	19	0	16	0	3
California	273	2	181	125	7	17	15	7
Total	294	16	3,706	3,304	85	114	272	362

[1] New York City only.
[2] Week ended earlier than Saturday.
[3] Typhus fever, week ended June 9, 1934, 26 cases, as follows: Maryland, 3; Virginia, 1; Georgia, 5; Florida, 1; Alabama, 2; Texas, 14.
[4] Rocky Mountain spotted fever, week ended June 9, 1934, 15 cases, as follows: Maryland, 2; Montana, 1; Idaho, 3; Wyoming, 8; Oregon, 1.
[5] Exclusive of Oklahoma City and Tulsa.

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
February 1934										
Pennsylvania	12	246	-------	2	7,509	3	3	2,916	0	47
March 1934										
Pennsylvania	18	253	-------	1	14,732	2	1	3,850	0	34
April 1934										
California	12	170	150	7	3,968	5	36	871	26	28
Pennsylvania	15	241	-------	-------	20,537	2	4	3,327	0	49
May 1934										
Arkansas	5	25	40	202	196	78	3	21	14	18
Connecticut	4	8	3	-------	638	-------	1	265	0	3
Delaware	-------	6	-------	-------	512	-------	0	25	0	6
District of Columbia	-------	48	6	-------	314	-------	0	50	0	4
Georgia	1	19	203	131	1,350	30	1	12	-------	51
Maine	-------	12	2	-------	78	-------	0	63	0	20
Nebraska	4	37	-------	-------	1,263	-------	0	110	34	5
Vermont	-------	-------	-------	-------	248	-------	0	70	0	19
Wyoming	-------	2	-------	-------	494	-------	0	48	18	1

February 1934

	Cases
Pennsylvania	
Anthrax	3
Chicken pox	4, 322
Dysentery	8
German measles	182
Lethargic encephalitis	8
Mumps	2, 168
Ophthalmia neonatorum	9
Trachoma	1
Trichinosis	1
Tularaemia	1
Undulant fever	8
Whooping cough	2, 160

March 1934

	Cases
Pennsylvania	
Chicken pox	4, 544
Dysentery	2
German measles	413
Lead poisoning	1
Lethargic encephalitis	9
Mumps	3, 230
Ophthalmia neonatorum	6
Psittacosis	7
Trachoma	1
Trichinosis	9
Undulant fever	4
Whooping cough	2, 775

April 1934

	Cases
Actinomycosis	
Pennsylvania	1
Beriberi	
California	1
Chicken pox	
California	1, 893
Pennsylvania	3, 159
Dysentery	
California (amoebic)	33
California (bacillary)	21
Pennsylvania	6
Food poisoning	
California	36
German measles	
California	753
Pennsylvania	593
Granuloma, coccidioidal	
California	4
Leprosy	
California	1
Lethargic encephalitis	
California	2
Pennsylvania	5
Mumps	
California	2, 181
Pennsylvania	3, 131
Ophthalmia neonatorum:	
Pennsylvania	12
Paratyphoid fever	
California	3
Psittacosis	
Pennsylvania	4
Rabies in animals	
California	92
Rabies in man	
California	1
Rocky Mountain spotted fever	
California	2
Septic sore throat	
California	8
Tetanus	
California	7
Trachoma	
California	20
Pennsylvania	2
Trichinosis	
California	4
Pennsylvania	2
Tularaemia	
California	2
Undulant fever	
California	13
Pennsylvania	6
Whooping cough	
California	1, 904
Pennsylvania	2, 528

May 1934

	Cases
Anthrax	
Georgia	1
Chicken pox	
Arkansas	15
Connecticut	563
Delaware	65
District of Columbia	54
Georgia	127
Maine	126
Nebraska	235
Vermont	153
Wyoming	30
Conjunctivitis	
Connecticut	9
Dysentery	
Georgia (amoebic)	6
Georgia (bacillary)	39
German measles	
Connecticut	32
Maine	120
Wyoming	17
Hookworm disease	
Arkansas	4
Georgia	147
Lethargic encephalitis	
Connecticut	2
District of Columbia	1
Georgia	1
Mumps	
Arkansas	86
Connecticut	423
Delaware	62
Georgia	157
Maine	24
Nebraska	68
Vermont	29
Wyoming	5
Ophthalmia neonatorum	
Arkansas	1
Paratyphoid fever	
Connecticut	3
Rabies in animals.	
Connecticut	2
Maine	1
Rocky Mountain spotted fever	
Wyoming	39
Septic sore throat	
Connecticut	15
Georgia	22
Wyoming	1
Tetanus	
Connecticut	2
Georgia	4
Trachoma	
Arkansas	5
Connecticut	1
Trichinosis	
Connecticut	1
Tularaemia	
Arkansas	4
Georgia	7
Nebraska	1
Wyoming	1
Typhus fever	
Georgia	20
Undulant fever	
Connecticut	7
Delaware	1
Georgia	4
Maine	2
Nebraska	1
Vermont	1
Vincent's infection.	
Maine	2
Whooping cough:	
Arkansas	74
Connecticut	226
Delaware	50
District of Columbia	116
Georgia	555
Maine	369
Nebraska	134
Vermont	106
Wyoming	5

CASES OF VENEREAL DISEASES REPORTED FOR APRIL 1934

This statement is published monthly for the information of health officers in order to furnish current data as to the prevalence of the venereal diseases The figures are taken from reports received from State health officers. They are preliminary and are, therefore, subject to correction It is hoped that the publication of these reports will stimulate more complete reporting of these diseases

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
Alabama	320	1 19	85	0 32
Arizona	22	49	131	2. 89
Arkansas	537	2 87	221	1. 18
California [1]				
Colorado [2]				
Connecticut [3]	224	1 36	96	.58
Delaware	90	3. 73	52	2. 16

Cases of venereal diseases reported for April 1934—Continued

State	Syphilis		Gonorrhea	
	Cases reported during month	Monthly case rates per 10,000 population	Cases reported during month	Monthly case rates per 10,000 population
District of Columbia	148	2.99	89	1.80
Florida	302	1.01	50	.32
Georgia	563	1.93	337	1.16
Idaho	0		0	
Illinois	1,894	2.42	1,293	1.65
Indiana	146	.44	130	.40
Iowa [3]	117	.47	131	.53
Kansas	129	.68	63	.33
Kentucky	192	.73	303	1.14
Louisiana	209	.97	136	.63
Maine	42	.52	49	.61
Maryland	663	3.99	263	1.58
Massachusetts	389	.90	431	1.00
Michigan	483	.96	344	.68
Minnesota	379	1.46	304	1.17
Mississippi	1,056	5.16	1,501	7.33
Missouri	623	1.70	300	.82
Montana [3]	52	.97	13	.24
Nebraska	43	.31	57	.41
Nevada [2]				
New Hampshire	14	.30	14	.30
New Jersey	691	1.65	219	.52
New Mexico	76	1.75	25	.58
New York	4,855	3.74	1,139	.88
North Carolina	987	3.01	280	.85
North Dakota	27	.39	40	.58
Ohio [3]	599	.88	229	.34
Oklahoma [3]	134	.64	101	.48
Oregon	19	.19	59	.60
Pennsylvania [1]				
Rhode Island	45	.64	47	.67
South Carolina [3]	403	2.31	502	2.87
South Dakota	2	.03	17	.24
Tennessee	1,180	4.43	431	1.62
Texas	153	.25	27	.04
Utah [2]				
Vermont	19	.53	18	.50
Virginia	357	1.46	233	.95
Washington	160	1.00	194	1.21
West Virginia [1]				
Wisconsin [4]	33	.11	157	.52
Wyoming [2]				
Total	18,377	1.74	10,111	.96

[1] Have been reporting regularly, but no report received for current month.
[2] Not reporting.
[3] Incomplete.
[4] Only cases of syphilis in the infectious stage are reported.

NOTE.—Surveys in which all medical sources have been contacted in representative communities throughout the United States have revealed that the monthly rate per 10,000 population is 6.6 for syphilis and 10.2 for gonorrhea.

WEEKLY REPORTS FROM CITIES

City reports for week ended June 2, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	5	3	0	0	1	10	30
New Hampshire											
Concord	0	------	0	8	2	0	0	1	0	3	7
Manchester	------	------	------	------	------	------	------	------	------	------	------
Nashua	0	------	------	23	------	0	0	------	0	0	------
Vermont											
Barre	0	------	0	0	0	0	0	0	0	0	------
Burlington	0	------	0	8	0	9	0	0	0	0	8
Massachusetts											
Boston	6	------	1	142	18	44	0	11	0	39	228
Fall River	0	------	0	2	0	2	0	3	0	3	24
Springfield	0	------	0	4	0	5	0	1	0	5	27
Worcester	1	------	0	1	9	14	0	2	0	11	------
Rhode Island											
Pawtucket	0	------	0	0	0	0	0	0	0	0	14
Providence	3	------	0	3	2	14	0	1	0	22	46
Connecticut											
Bridgeport	0	------	0	0	3	8	0	2	0	0	32
Hartford	------	------	------	------	------	------	------	------	------	------	------
New Haven	0	------	0	0	1	1	0	0	0	9	48
New York											
Buffalo	1	------	1	40	25	19	0	10	0	19	156
New York	32	3	2	389	136	237	0	84	6	111	1,416
Rochester	0	------	0	3	4	55	0	1	0	9	63
Syracuse	0	------	0	46	7	14	0	0	0	52	52
New Jersey											
Camden	2	1	0	7	1	5	0	0	0	3	28
Newark	0	3	0	42	3	18	0	2	0	24	82
Trenton	0	------	0	23	2	14	0	3	0	0	37
Pennsylvania											
Philadelphia	5	1	1	241	21	93	0	23	3	51	443
Pittsburgh	11	2	1	195	17	52	0	7	0	22	140
Reading	0	------	0	4	1	4	0	2	0	11	25
Ohio											
Cincinnati	3	2	0	6	9	30	0	4	0	14	117
Cleveland	5	11	1	308	19	94	0	11	0	51	199
Columbus	1	2	2	8	8	55	0	6	0	17	95
Toledo	1	------	0	160	3	54	0	3	0	71	61
Indiana											
Fort Wayne	2	------	------	10	------	12	0	------	1	0	------
Indianapolis	1	------	0	274	12	5	0	6	0	36	------
South Bend	0	------	0	14	2	8	0	1	0	0	13
Terre Haute	1	------	0	1	3	1	0	2	0	0	19
Illinois											
Chicago	0	2	4	666	61	252	0	50	1	124	687
Cicero	------	------	------	------	------	------	------	------	------	------	5
Springfield	0	------	0	18	3	6	0	0	0	11	18
Michigan											
Detroit	5	3	0	157	29	132	0	33	0	67	290
Flint	1	------	0	6	2	39	0	2	0	15	34
Grand Rapids	0	------	0	10	0	22	0	1	0	1	36
Wisconsin											
Kenosha	0	------	1	1	0	5	0	2	0	3	12
Madison	0	------	0	53	2	3	0	3	0	11	27
Milwaukee	2	------	0	226	2	144	0	2	0	66	104
Racine	0	------	0	2	0	6	0	0	0	8	17
Superior	0	------	0	8	0	0	0	0	0	0	13
Minnesota											
Duluth	0	------	0	0	1	1	0	1	1	0	15
Minneapolis	1	------	2	28	5	19	0	0	0	12	92
St Paul	0	------	0	10	8	6	0	2	0	23	78
Iowa											
Davenport	0	------	------	7	------	1	0	------	0	1	------
Des Moines	0	------	------	16	------	10	0	------	0	0	31
Sioux City	0	------	------	115	------	5	0	------	0	7	------
Waterloo	1	------	------	0	------	1	0	------	0	1	------

City reports for week ended June 2, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Missouri:											
Kansas City											
St Joseph	3		0	3	9	0	0	1	0	1	60
St Louis	14	1	0	6	15	14	0	8	2	61	240
North Dakota											
Fargo	0		0	2	0	1	0	0	0	21	3
Grand Forks	1			0		6	0		0	5	
South Dakota											
Aberdeen	0			39		0	0		0	19	
Sioux Falls	0			5		0	0		0	0	6
Nebraska.											
Omaha	1		0	41	10	8	2	2	0	9	65
Kansas											
Topeka											
Wichita	0		0	25	2	5	0	0	0	15	22
Delaware											
Wilmington	0		0	26	3	1	0	1	0	5	26
Maryland											1
Baltimore	4	1	2	875	10	28	0	11	2	88	198
Cumberland	0		0	9	1	0	0	1	0	0	15
Frederick	0		0	1	0	1	0	0	0	0	2
District of Columbia											
Washington	10		0	33	12	7	0	12	1	25	150
Virginia											
Lynchburg	0		0	58	1	0	0	0	0	24	8
Norfolk	0		0	9	2	2	0	0	1	6	31
Richmond	1		2	159	2	2	0	3	0	0	55
Roanoke	1		0	4	1	1	0	2	0	10	18
West Virginia											
Charleston	0		0	29	1	0	0	0	1	1	16
Huntington	0			0		0	0		0	0	
Wheeling	0		2	10	0	17	0	0	0	2	18
North Carolina											
Raleigh	0		0	12	0	0	0	0	0	20	15
Wilmington	0		0	14	0	1	0	0	1	21	11
Winston-Salem	0		0	3	0	1	0	2	0	0	11
South Carolina											
Charleston	0	1	0	3	1	0	0	0	1	1	17
Columbia	0		0	0	1	0	0	0	0	0	25
Greenville	0		0	0	1	0	0	0	0	4	11
Georgia											
Atlanta	1	1	1	7	5	2	0	3	3	4	77
Brunswick	0		0	0	0	0	0	0	0	0	5
Savannah	0	1	0	21	1	0	0	3	2	1	41
Florida											
Miami	2		0	97	1	0	0	1	0	13	27
Tampa	0	1	1	63	0	0	0	1	1	0	16
Kentucky											
Ashland											
Lexington	1		0	50	3	1	0	3	0	5	21
Louisville	1	2	0	109	6	14	0	4	0	21	82
Tennessee											
Memphis	2		1	18	6	2	0	7	0	22	69
Nashville	1		0	2	2	0	0	2	0	11	42
Alabama:											
Birmingham	1	1	0	25	4	3	0	2	0	3	57
Mobile	0		1	6	1	0	0	1	0	3	21
Montgomery	2			123		1	0		0	2	
Arkansas											
Fort Smith	5			0		0	0		0	6	
Little Rock	0		0	1	6	2	0	1	0	2	7
Louisiana:											
New Orleans	10	1	2	52	9	4	0	9	5	3	140
Shreveport	0		0	3	3	0	0	1	0	3	33
Oklahoma											
Oklahoma City	2	10	1	0	6	1	0	3	0	0	37
Tulsa	0			0		1	0		0	4	
Texas.											
Dallas	2	1	1		2	1	0	2	1	15	43
Fort Worth	1		0	4	1	3	0	1	0	4	22
Galveston	1		0	1	2	0	0	1	0	0	13
Houston	5		0	2	7	5	0	4	0	0	77
San Antonio	0		1	3	4	0	1	11	1	0	77

City reports for week ended June 2, 1934—Continued

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Montana:											
Billings	0	------	0	0	0	0	0	0	0	3	6
Great Falls	0	------	0	2	0	0	0	0	0	3	8
Helena	0	------	0	0	0	0	0	0	0	0	5
Missoula	0	------	0	0	1	1	0	0	1	0	10
Idaho:											
Boise	0	------	0	6	0	0	0	0	0	0	5
Colorado:											
Denver	2	31	0	576	2	8	0	2	0	37	63
Pueblo	0	------	0	36	2	5	0	0	0	5	7
New Mexico:											
Albuquerque	0	------	0	8	1	1	0	2	0	0	7
Utah:											
Salt Lake City	0	------	0	12	3	6	1	2	0	93	37
Nevada:											
Reno	0	------	0	1	3	0	0	0	0	0	4
Washington:											
Seattle	0	------	4	12	8	27	0	3	1	27	76
Spokane	0	------	0	------	1	4	0	0	2	18	33
Tacoma	0	------	0	93	0	1	0	1	0	12	26
Oregon:											
Portland	0	------	0	14	3	23	0	4	0	11	70
Salem	0	1	------	2	------	1	0	------	0	1	------
California:											
Los Angeles	13	18	1	15	6	23	0	27	0	32	278
Sacramento	0	------	0	3	0	1	0	3	0	1	32
San Francisco	0	2	0	277	4	12	0	4	0	7	132

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
New York:			
Buffalo	0	1	0
New York	1	2	1
Syracuse	1	0	0
New Jersey:			
Newark	0	1	0
Pennsylvania:			
Philadelphia	1	1	0
Pittsburgh	1	1	0
Ohio:			
Cleveland	1	0	0
Indiana:			
Indianapolis	0	1	0
Illinois:			
Chicago	12	3	0
Michigan:			
Detroit	1	1	0
Minnesota:			
Duluth	0	1	0

State and city	Meningococcus meningitis		Poliomyelitis cases
	Cases	Deaths	
Missouri:			
St. Joseph	0	1	0
St. Louis	2	1	0
Georgia:			
Savannah	0	0	1
Louisiana:			
New Orleans	1	1	1
Oklahoma:			
Oklahoma City	1	0	0
Idaho:			
Boise	0	0	1
Colorado:			
Denver	0	1	0
Washington:			
Spokane	0	0	2
California:			
Los Angeles	0	0	110
San Francisco	0	0	4

Lethargic encephalitis.—Cases: Little Rock, 1; San Francisco, 1.

Pellagra.—Cases: Baltimore, 2; Charleston, S.C., 5; Savannah, 4; Miami, 1; Louisville, 1; Birmingham, 2; Montgomery, 1.

Typhus fever.—San Antonio, 1 case.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended May 19, 1934.—During the 2 weeks ended May 19, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, for 7 provinces, as follows

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario [1]	Saskatchewan	British Columbia	Total
Cerebrospinal meningitis				1			1	2
Chicken pox				129	176	50	67	422
Diphtheria		4		25	8	11	1	49
Dysentery				48				48
Erysipelas		3		12	5	4	2	26
Influenza		9		8	13	1	50	81
Measles		82	11	624	39	100	5	861
Mumps		2			144	71	74	291
Paratyphoid fever					1			1
Pneumonia		4			9	13	8	34
Poliomyelitis				2		1		3
Scarlet fever		21	2	113	161	15	146	458
Trachoma						3	6	9
Tuberculosis	8	4	14	122	69	38	49	304
Typhoid fever		1	2	32	4	5	1	45
Undulant fever							2	2
Whooping cough		28		167	185	42	34	456

[1] No report was received from Ontario for the week ended May 12, 1934

NOTE.—Manitoba and Alberta did not report for the weeks ended May 12 and May 19, 1934

Quebec Province—Communicable diseases—Two weeks ended June 2, 1934.—The Bureau of Health of the Province of Quebec, Canada, reports cases of certain communicable diseases for the 2 weeks ended June 2, 1934, as follows:

Disease	Cases	Disease	Cases
Cerebrospinal meningitis	4	Ophthalmia neonatorum	1
Chicken pox	171	Poliomyelitis	3
Diphtheria	25	Scarlet fever	125
Dysentery (amoebic)	1	Tuberculosis	79
Erysipelas	11	Typhoid fever	55
German measles	12	Undulant fever	2
Influenza	2	Whooping cough	236
Measles	591		

FRANCE

Vital statistics—Years 1932 and 1933.—During the years 1932 and 1933, births, deaths, marriages, and divorces were reported in France, as follows.

	1932	1933		1932	1933
Number of marriages	314,878	315,466	Stillbirths	27,537	26,025
Number of divorces	21,848	20,690	Number of deaths	660,882	661,082
Number of live births	722,246	682,680	Deaths under 1 year of age	55,177	51,015

NOTE —The estimated population for France for the midyear 1932 is 41,840,000

YUGOSLAVIA

Communicable diseases—April 1934 —During the month of April 1934 certain communicable diseases were reported in Yugoslavia, as follows

Disease	Cases	Deaths	Disease	Cases	Deaths
Anthrax	26	6	Poliomyelitis	1	
Cerebrospinal meningitis	11	11	Scarlet fever	206	5
Diphtheria and croup	502	59	Sepsis	7	4
Dysentery	15	1	Tetanus	38	16
Erysipelas	151	9	Typhoid fever	89	9
Measles	967	21	Typhus fever	445	31
Paratyphoid fever	5				

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

(NOTE —A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for May 25, 1934, pp 636–648 A similar cumulative table will appear in the PUBLIC HEALTH REPORTS to be issued June 29, 1934, and thereafter, at least for the time being, in the issue published on the last Friday of each month)

Cholera

Philippine Islands —During the week ended June 9, 1934, no cholera was reported in the Philippine Islands

Typhus Fever

Belgian Congo.—During the week ended May 19, 1934, 114 cases of typhus fever with 7 deaths were reported in the Territories of Ruanda-Urundi, Belgian Congo.

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UNITED STATES TREASURY DEPARTMENT

PUBLIC HEALTH REPORTS

ISSUED WEEKLY

BY THE UNITED STATES PUBLIC HEALTH SERVICE

VOLUME 49 :: :: NUMBER 26

JUNE 29 - - - - - 1934

IN THIS ISSUE

Sickness Among Industrial Employees, First Quarter, 1934
Production of Experimental Saponin Anemia in the Rat
A Table of Pellagra-Preventive Values of Various Foods
Deaths in Large Cities During the Week Ended June 9
Current State and City Reports of Communicable Diseases
Quarantinable and Other Diseases in Foreign Countries

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON: 1934

For sale by the Superintendent of Documents, Washington, D.C. - - - - - Price 5 cents
Subscription price, $2 a year

UNITED STATES PUBLIC HEALTH SERVICE

HUGH S CUMMING, *Surgeon General*

DIVISION OF SANITARY REPORTS AND STATISTICS

Asst Surg Gen R C WILLIAMS, *Chief of Division*

The PUBLIC HEALTH REPORTS, first published in 1878 under authority of an act of Congress of April 29 of that year, is issued weekly by the United States Public Health Service through the Division of Sanitary Reports and Statistics, pursuant to the following authority of law United States Code, title 42, sections 7, 30, 93; title 44, section 220

It contains (1) current information regarding the prevalence and geographic distribution of communicable diseases in the United States insofar as data are obtainable, and of cholera, plague, smallpox, typhus fever, yellow fever, and other important communicable diseases throughout the world; (2) articles relating to the cause, prevention, and control of disease; (3) other pertinent information regarding sanitation and the conservation of the public health

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CONTENTS

	Page
Sickness among male industrial employees during the first quarter of 1934	749
Experimental saponin anemia in the albino rat	751
Table showing the pellagra-preventive value of various foods	754
Court decision on public health	757
Deaths during week ended June 9, 1934	
Deaths and death rates for a group of large cities in the United States	758
Death claims reported by insurance companies	758
PREVALENCE OF DISEASE	
United States	
Current weekly State reports	
Reports for weeks ended June 16, 1934, and June 17, 1933	759
Summary of monthly reports from States	761
Plague-infected rodents in Tulare and Modoc Counties, Calif	762
Weekly reports from cities.	
City reports for week ended June 9, 1934	763
Foreign and insular	
Canada—Provinces—Communicable diseases—2 weeks ended June 2, 1934	766
Denmark—Communicable diseases—September–December 1933	766
Italy—Communicable diseases—4 weeks ended January 7, 1934	767
Cholera, plague, smallpox, typhus fever, and yellow fever—	
Cholera	768
Plague	770
Smallpox	773
Typhus fever	778
Yellow fever	781

PUBLIC HEALTH REPORTS

VOL. 49 JUNE 29, 1934 NO. 26

SICKNESS AMONG MALE INDUSTRIAL EMPLOYEES DURING THE FIRST QUARTER OF 1934[1]

By Dean K Brundage, *Statistician, Office of Industrial Hygiene and Sanitation United States Public Health Service*

The favorable rate of sickness frequency among male industrial employees reported for the final quarter of 1933 persisted through the initial quarter of 1934 Sickness, including nonindustrial injuries, which caused disability for more than 1 week occurred at a lower frequency in the first quarter of this year than was recorded for the same period of any one of the 5 preceding years, and was 33 percent below the average rate for the first quarter of the years 1929 to 1933, inclusive. Nonindustrial injuries, however, occurred at a higher rate than in the corresponding quarter of earlier years. Thus the gain was due to less frequent occurrence of disease.

The respiratory group of diseases accounted for the major portion of the improvement in the incidence of illness. The frequency of these diseases expressed in terms of number of new cases per 1,000 men per year was 34 9, as compared with an average of 69.6 in the first quarter of the 5 preceding years. This is just one-half of the average rate. The respiratory disease which contributed the most to the low rate for sickness frequency was influenza or grippe, the rate for which was 62 percent below the 5-year average. The upper respiratory diseases (bronchitis and diseases of the pharynx and tonsils) decreased about 32 percent from the level recorded for the first quarter of the years 1929 to 1933, inclusive, pneumonia decreased 31 percent, and respiratory tuberculosis 36 percent. It is apparent, accordingly, that the more serious as well as the less serious diseases of the respiratory system occurred at lower incidence during the first quarter of 1934 than in the same period of the earlier years under review.

These results apply to a sample of approximately 150,000 male industrial employees. They may not represent the sickness experience of industrial workers in the country as a whole, although the sample includes employees in almost all parts of the United States. However, the majority of the men included are located in the North Central, North Atlantic, and New England States.

[1] The report for the fourth quarter of 1933 was published in the Public Health Reports of March 30, 1934, vol 49, no. 13, and for the year 1933 in comparison with earlier years, in the Public Health Reports of May 25, 1934, vol. 49, no 21

Nonrespiratory diseases as a whole decreased 19 percent from the 5-year average—a substantial decrease, but not spectacular like the 50 percent decline in the incidence of respiratory illness.

TABLE 1.—*Frequency of disability lasting 8 calendar days or longer in the first quarter of 1934 compared with the same quarter of preceding years (male morbidity experience of industrial companies which reported their cases to the United States Public Health Service)* [1]

Diseases and disease groups which caused disability (Numbers in parentheses are disease title numbers from the International List of the Causes of Death, fourth revision, Paris, 1929)	Annual number of disabilities per 1,000 men in the first quarter of—				
	1934	1933	1932	1931	5 years, 1929–1933, inclusive
Sickness and nonindustrial injuries [2]	89.1	118.2	119.1	135.5	133.1
Nonindustrial injuries	11.6	10.1	11.1	10.6	11.0
Sickness [2]	77.5	108.1	108.0	124.9	122.1
Respiratory diseases	34.9	58.7	58.3	75.2	69.6
Bronchitis, acute and chronic (106)	4.5	3.6	6.4	6.1	6.0
Diseases of the pharynx and tonsils (115a)	4.4	5.6	5.8	7.1	7.1
Influenza and grippe (11)	17.2	41.0	36.7	50.7	45.7
Pneumonia, all forms (107–109)	2.7	2.8	2.6	4.1	3.9
Tuberculosis of the respiratory system (23)	.7	.7	1.0	1.3	1.1
Other respiratory diseases (104, 105, 110–114)	5.4	5.0	5.8	5.9	5.8
Nonrespiratory diseases	42.6	49.4	49.7	49.7	52.5
Diseases of the stomach, cancer excepted (117–118)	3.2	3.5	4.2	3.8	4.2
Diarrhea and enteritis (120)	.8	.6	1.0	.7	.9
Appendicitis (121)	3.8	3.1	3.3	3.7	3.8
Hernia (122a)	1.2	1.6	1.9	1.9	1.8
Other digestive diseases (115b, 116, 122b–129)	2.7	3.7	2.9	2.9	3.3
Rheumatic group, total	9.5	12.9	13.6	12.4	13.1
Rheumatism, acute and chronic (56, 57)	4.7	7.3	6.4	6.3	6.6
Diseases of the organs of locomotion (156b)	2.8	3.0	4.6	3.7	3.9
Neuralgia, neuritis, sciatica (87a)	2.0	2.6	2.6	2.4	2.6
Neurasthenia and the like (part of 87b)	.5	.8	1.3	1.4	1.2
Other diseases of the nervous system (78–85, part of 87b)	1.5	1.7	.9	1.2	1.3
Diseases of the heart and arteries and nephritis (90–99, 102, 130–132)	3.6	4.7	3.7	4.2	4.3
Other genito urinary diseases (133–138)	2.4	2.0	2.1	2.6	2.3
Diseases of the skin (151–153)	2.4	2.5	2.3	2.7	3.1
Epidemic and endemic diseases except influenza (1–10, 12–18, 33, 37, 38, part of 39 and 44)	3.7	2.9	3.0	3.1	3.6
Ill-defined and unknown causes (200)	1.9	2.0	2.1	1.7	2.0
All other diseases (19–22, 24–32, 36 part of 39 and 44, 40–43, 45–55, 58–77, 88, 89, 100, 101, 103, 154–156a, 157, 162)	5.4	7.4	7.4	7.4	7.6
Average number of males covered in the record	152,439	134,788	146,990	158,801	152,293
Number of companies included	35	35	33	27	29

[1] In 1933 and 1934 the same companies are included The rates for 1932 and 1931 cover 33 and 27 companies, respectively, instead of 35 as in 1933 and 1934.

[2] Exclusive of disability from venereal diseases

Within the broad category of nonrespiratory diseases the results for different subgroups were not uniformly favorable. Although the largest percentage decrease from the 5-year average was recorded for neurasthenia, the frequency of other diseases of the nervous system, which include the more serious conditions such as cerebral hemorrhage and mental disorder, was higher in the first quarter of each of the past 2 years than in the same period of the 4 years preceding 1933. The rate for appendicitis, which was relatively low in the first 3 months of 1932 and 1933, rose in the first quarter of 1934 to the rate recorded for the first quarter of the years 1929 to 1933, inclusive. A relatively high incidence is shown for the epidemic and endemic diseases during

the recent quarter; this result was due to an outbreak of amoebic dysentery in one of the reporting factories in Chicago. When these cases were deducted it was found that the rate was only 2.7 as compared with 2.9 and 3.0 in the corresponding quarter of 1933 and 1932, respectively.

Besides neurasthenia, other subgroups among the nonrespiratory diseases which showed substantially lower incidence in the first quarter of 1934 than in the same quarter of the years 1929 to 1933, inclusive, were as follows: hernia (decrease 33 percent); the rheumatic group (decrease 27 percent); diseases of the stomach, cancer excepted (decrease 24 percent); and diseases of the skin (decrease 23 percent).

In general, the incidence rate of morbidity causing incapacitation for 8 days or longer as measured by the frequency of claims for sickness benefits among about 150,000 male members of industrial sick-benefit organizations indicates marked improvement over the rates of sickness prevailing several years ago.

EXPERIMENTAL SAPONIN ANEMIA IN THE ALBINO RAT

By E F Stohlman, *Junior Pharmacologist,* and Maurice I. Smith, *Principal Pharmacologist, United States Public Health Service, National Institute of Health*

In investigations on the effects of remedial agents upon the hematopoietic organs it is desirable to have a well-defined and easily reproducible experimental anemia in a suitable laboratory animal. With this aim in view an attempt has been made to produce such a condition in the albino rat by means of repeated intravenous injections of saponin, on the supposition that the more or less continuous hemolyzing action of this substance would ultimately produce the desired result.

Firket and Campos (1) studied the effect of saponin on the blood picture of rabbits with special reference to the bone marrow. They reported considerable reduction in the red blood cells in their rabbits, though irregularly, and usually only upon the administration of large and fatal doses. Handowsky and Trossel (2) gave several doses of saponin to rabbits at 5- to 10-day intervals and produced slight to moderate reduction in erythrocytes with but little effect on the hemoglobin.

In the present experiments full-grown albino rats were used. They were kept on a stock diet of bread and milk and mixed grains. Lettuce was given two or three times a week. The saponin was injected into one of the tail veins, usually daily, in 0.08-percent solution in normal saline. Records were kept of the weights of the animals, and at 8- or

10-day intervals blood examinations were made with reference to the red blood cells and hemoglobin.[1]

Preliminary experiments indicated that acute destruction of the blood cells could not be accomplished in the rat even with lethal doses of saponin. It was therefore decided to administer the substance repeatedly in maximum tolerated doses, i e , 1 to 2 mg per kilo.

The sample of saponin used, when tested for its hemolyzing action on washed rabbits' erythrocytes suspended in physiologic saline in the proportion of 1:4, showed the following:

	Percent hemolysis
1:200,000	13
1:100,000	54
1:50,000	75

The extent of hemolysis was determined colorimetrically in the centrifugated samples after a 4-hour exposure to the saponin at room temperature.

The toxicity of the saponin used was studied in rats on intravenous injection. A dose of 5.0 mg per kilo was uniformly fatal in from 1 to 4 hours. Doses of 1 to 2 mg per kilo were uniformly survived, and in about 50 percent of the animals such doses could be injected daily for many days without toxic manifestations other than the effects on the blood.

The blood picture following repeated daily intravenous injections of 1 to 2 mg per kilo of saponin is summarized in table 1. In the first column are given the figures to show the normal weights, red blood cells, hemoglobin, and color index. In the second column similar data are presented at the height of saponin effect. The injections were then discontinued. Recovery, which usually occurred in about 5 to 7 weeks, is shown in the third column.

TABLE 1.—*Effect of intravenous injections of saponin on the blood picture of the rat*

Number	Before the injections, normal				After 23-42 injections, total of 34-70 mg per kilo				Recovery, 37-49 days after last injection			
	Weight	RBC	Hb	Color index	Weight	RBC	Hb	Color index	Weight	RBC	Hb	Color index
1	204	9.00	84	0.93	168	2.60	36	1.39	234	8.30	77	0.93
2	218	9.96	80	.80	180	4.91	53	1.08	254	8.37	83	.99
3	230	10.79	96	.89	104	4.67	53	1.13	300	8.17	79	.97
4	240	9.57	81	.85	180	3.18	37	1.16	([1])			
5	220				193	4.14	31	.75	([1])			
6	210				180	5.68	51	.90	244	10.63	87	.82

[1] Killed accidentally.

From the data in the table it will appear that the normal mature rat, having a red blood cell count of about 10 million per cubic millimeter and a hemoglobin of about 80 to 95 percent, can be made

[1] Newcomer type hemoglobinometer was used

anemic by repeated intravenous injections of sublethal doses of saponin to the extent of 2 5 to 5 million red blood cells and hemoglobin of from 35 to 50 percent. With the progress of the anemia there is a tendency for the color index to rise Recovery sets in upon discontinuing the injections. The progress of recovery is slow, however, during the first 2 weeks, but is well on the way during the third and fourth weeks With the onset of recovery the color index tends to return to normal. Parallel with the blood changes there is a decline in body weight, with resumption of growth in 2 to 3 weeks after the

FIG. I

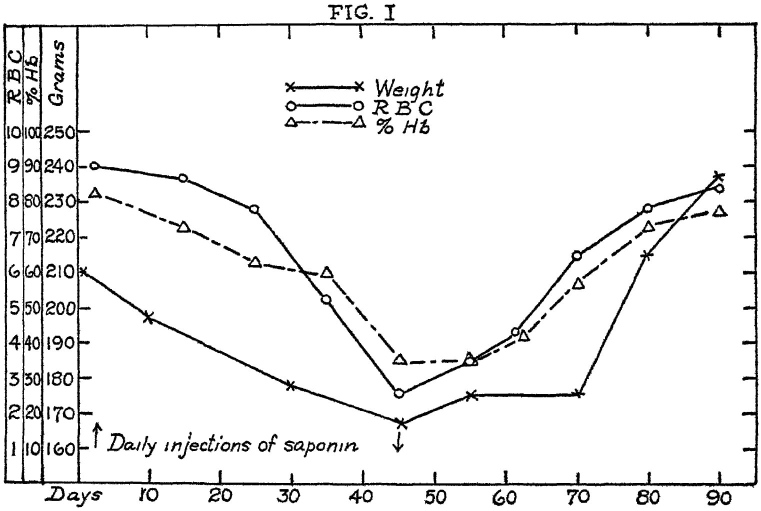

FIGURE 1 —Effect of repeated intravenous injections of maximum tolerated doses of saponin upon the weight, hemoglobin, and red blood cells

injections are discontinued These events are illustrated in figure 1 by a typical experiment (rat no. 1).

SUMMARY

By means of repeated daily intravenous injections of maximum tolerated doses of saponin it is possible to produce a moderately severe anemia in the rat, with the red blood cells and hemoglobin reduced to about one-half or less of the normal. Upon discontinuing the injections the anemic condition undergoes but little change for about 10 to 20 days; then regeneration sets in with nearly complete recovery in anoth^r three weeks.

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TABLE SHOWING THE PELLAGRA-PREVENTIVE VALUE OF VARIOUS FOODS

By W H SEBRELL, *Passed Assistant Surgeon, United States Public Health Service*

The accompanying table has been compiled in order to make readily available a list of foods which have been thoroughly tested for their pellagra-preventive value It is intended primarily for use in the treatment and prevention of pellagra, and only those foods are included which have been tested under controlled conditions in both human beings and dogs The results of vitamin G tests on rats have been ignored because of the lack of quantitative data necessary for the practical application of these results to human pellagra In the present state of our knowledge, only the most general terms can be used to designate the pellagra-preventive value of a food. In order to make a division into groups which will be of practical value without being unwarrantedly exact, the words *Good, Fair, Slight,* and *None* have been selected The *quantity* used must be kept in mind in each instance since smaller amounts than those indicated would in all probability have less value.

Good signifies that, in the quantity indicated and under the conditions of the experiment, the food contained enough of the pellagra-preventive factor to prevent the disease This is the most valuable class of foods in the prevention and treatment of pellagra

Fair signifies that, in the quantity indicated and under the conditions of the experiment, the food showed appreciable, and in some instances considerable, pellagra-preventive value, but one or more of the experimental subjects developed the disease, usually after considerable delay. Thus, a food under this heading contains enough of the vitamin to be of value, but should not be relied upon alone in the treatment and prevention of the disease. The principal value of these foods lies in the variety of items afforded as adjuncts to the *good* sources of the preventive factor

Slight signifies that, in the quantity indicated, and under the conditions of the experiment, the food, although failing to prevent the disease, caused a slight delay in onset Practically, this group may be disregarded in the treatment and prevention of pellagra.

None signifies that, in the quantity used, the results of the experiments indicate that the food either contains none of the preventive factor or such a small amount that it may be regarded, for practical purposes, as being entirely without value in the treatment and prevention of pellagra.

Pellagra-preventive value of various foods

Food	Daily amount	Pellagra-preventive value	References
Meats and fish			
Beef	*Grams*		
Fresh	200	Good	1, 2, 12.
Corned (canned)	200	do	3
Chicken (canned)	325	do	15
Haddock (canned)	340	Fair	5, 7.
Liver, pork (dried)	64	Good	2
Pork			
Shoulder, lean	200	do	10, 15
Salt	153	None	5
Rabbit	184	Good	15
Salmon (canned)	168	do	2, 14
Dairy products			
Butter	135	Slight	2, 12, 1.
Casein, leached	85	do	6, 13.
Egg, yolk (dried)	100	Fair	2
Milk			
Skim, fresh	(1)	do	2.
dried	105	do	13
Evaporated (canned)	(2)	do	3
Buttermilk	1,200	Good	12
Cereals			
Corn meal, whole, white	450	None	2
Cornstarch	366	do	16
Rolled oats	400	do	3
Rye meal	400	do	3
Wheat, whole	400	Slight	2
Oils and fats			
Cod-liver oil	128	None	2, 12.
Cottonseed oil	110	do	2
Lard	110	do	5
Vegetables			
Beans			
Green, stringless (canned)	550	Slight	9.
Kidney, red	360	Fair	3.
Navy	360	None	3
Soybean	360	Fair	2
Cabbage, green (canned)	482	do	8
Carrots	450	Slight	2, 11.
Collards (canned)	482	Good	8, 3
Cowpeas	178	Fair	2, 18.
Kale (canned)	534	Good	8
Lettuce, Cos (canned)	516	Slight	10
Mustard greens (canned)	533	Fair	8, 3.
Onions			
Green (canned)	502	Slight	10
Mature	525	None	9, 3.
Peas			
Green (dried)	360	Fair	5
Green (canned)	450	Good	7.
Potatoes			
Irish	450	None	3.
Sweet	450	do	3
Spinach (canned)	482	Fair	9, 3
Tomato, juice from canned	1,200	Good	11, 2.
Turnips, rutabaga	453	Slight	11, 2.
Turnip greens (canned)	482	Good	9, 3.
Fruits			
Apples, evaporated	250	None	3.
Prunes, dried	250	do	15.
Miscellaneous			
Gelatin	83	None	12.
Liver, Minot's extract 343	(3)	Good	4
Peanut meal	200	do	10, 3.
Wheat germ, ether extracted	150	do	2, 18
Yeast			
Baker's dried	30	do	17
Baker's, dried, autoclaved	60	do	7, 16
Brewer's, dried	30	do	13, 16.
Yeast vitamin powder	15	do	1, 16

[1] 30 cubic centimeters per kilo of body weight
[2] 15 cubic centimeters per kilo of body weight.
[3] Equivalent to 100 grams liver

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(14) Goldberger and Wheeler· A study of the pellagra-preventive action of canned salmon Pub. Health Rep., 44. 2769–2771 (1929).
(15) Unpublished data.
(16) Goldberger, Wheeler, Lillie, and Rogers: A further study of experimental blacktongue, with special reference to the blacktongue-preventive in yeast. Pub Health Rep., 43: 657–694 (1928).
(17) Walker and Wheeler. Influence on epilepsy of a diet low in the pellagra-preventive factor. Pub Health Rep , 46: 851–860 (1931).
(18) Goldberger and Wheeler: A study of the pellagra-preventive action of the cowpea (*Vigna sinensis*) and of commercial wheat germ. Pub. Health Rep., 42: 2383–2391 (1927).

COURT DECISION ON PUBLIC HEALTH

Resolution of city board of health providing for exclusion from school of unvaccinated pupils sustained—(Indiana Supreme Court; *Vonnegut et al.* v. *Baun*, 188 N E. 677; decided Jan. 31, 1934.) The board of health and charities of the city of Indianapolis adopted and legally published a resolution declaring, among other things, that, in the board's opinion, there was danger of a smallpox epidemic. It was resolved that all school teachers, parents, and guardians of school children over 6 years of age should submit their children to the board of health or to some regularly licensed physician for vaccination, and such vaccination was required by a certain date. It was declared that such teachers, parents, or guardian of a child who was not vaccinated according to the order should be subject to the penalties provided by section 431 of the municipal code and rule 29 of the State board of health, and, further, that each child not so vaccinated should be excluded from school until vaccinated or excused from the order as provided by the said code section.

An action was brought to enjoin the city board of health and charities from enforcing the order excluding unvaccinated children from school. A demurrer to the complaint was overruled and, the board refusing to plead further, there was a judgment for the plaintiff. From this judgment the members of the board appealed to the supreme court.

It was alleged that there was, in fact, no epidemic, but the appellate court, after pointing out that a statute and an ordinance of the city vested the board of health with jurisdiction to determine whether an epidemic existed, declared that "Under such authority, the determination of the board upon the question involved is conclusive in the absence of fraud or bad faith, and, since the resolution showing the determination by the board is set out in the complaint and there is no allegation of fraud or bad faith, the further allegation that there was, in fact, no epidemic of smallpox is of no force and effect and adds nothing to the complaint."

The contention was made by the appellee that section 8168, Burns' Ann. St. 1926, which was general as to all cities concerning the powers of boards of health, had been superseded by sections 10989 and 10990, Burns' Ann. St. 1926, which made a new and special provision as to first class cities. But, with regard to this, the supreme court said:

There are no repealing clauses in any of the statutes referred to. There are no conflicts or inconsistencies except that the latter sections provide for four members of the board of health in cities of the first class. There is no intimation that the boards in the latter cities are intended to have less power than boards in smaller cities. No reason is suggested why the statutes are not all in force. The later statutes show no evidence of a legislative intention to limit or prescribe the powers of boards of health. We must treat the powers conferred under all

of the statutes as still in force No inconsistency that would affect this action is pointed out

It was further claimed by the appellee (1) that, even if section 8168 was still in force, since no quarantine had been established thereunder no right to make a vaccination order had come into existence, and (2) that the board undertook to exercise powers which it did not possess and which were not conferred by the city ordinance, for the reason that it required school children to be vaccinated. In this the court declared that the appellee was in error, saying.

* * * Section 431 of the ordinance is self-executing The recital in the published resolution of the board that all children must be vaccinated is merely declaratory of the law as fixed by the ordinance The part of the resolution which required initiative on the part of the board of health was the order excluding children that had not been vaccinated from the schools This the board had ample power to do under section 430 of the city ordinance or under the general powers conferred by statute

Regarding the appellee's argument that, since another statutory provision made it a parent's duty to send his child to school, he could maintain an action to restrain interference with the performance of that duty by excluding his child for lack of vaccination, it was said by the court that the statute referred to was a compulsory attendance statute which had no connection with or relation to the statutes under which the board of health could exclude an unvaccinated child

The final contention made by the appellee was that the resolution violated constitutional rights "in that it abridges religious and civil liberties and matters relating to conscience of many of the citizens of said city." Concerning this, the court said that "The resolution merely prevents children who have not been vaccinated from attending school during an emergency in which they might transmit the disease to other school children or carry it from other school children back to their homes. The right of the State to require vaccination is not involved."

The judgment was reversed, with instructions to sustain the demurrer to the complaint.

DEATHS DURING WEEK ENDED JUNE 9, 1934

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

	Week ended June 9, 1934	Corresponding week, 1933
Data from 86 large cities of the United States		
Total deaths	8,189	7,960
Deaths per 1,000 population, annual basis	11.4	11.1
Deaths under 1 year of age	635	593
Deaths under 1 year of age per 1,000 estimated live births	59	[1] 49
Deaths per 1,000 population, annual basis, first 23 weeks of year	12.3	11.7
Data from industrial insurance companies		
Policies in force	67,799,549	67,832,442
Number of death claims	13,185	12,540
Death claims per 1,000 policies in force, annual rate	10.1	9.6
Death claims per 1,000 policies, first 23 weeks of year, annual rate	10.8	10.5

[1] Data for 81 cities.

PREVALENCE OF DISEASE

No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring

UNITED STATES

CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers

Reports for Weeks Ended June 16, 1934, and June 17, 1933

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 16, 1934, and June 17, 1933

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933
New England States								
Maine	--------	1	1	--------	11	1	0	0
New Hampshire	--------	--------	--------	--------	37	55	0	0
Vermont	--------	1	--------	--------	30	56	0	0
Massachusetts	6	16	--------	--------	885	608	2	1
Rhode Island	3	2	--------	--------	14	--------	0	0
Connecticut	3	4	--------	3	210	123	2	0
Middle Atlantic States								
New York	32	60	[1] 9	[1] 5	970	1,508	5	3
New Jersey	13	24	6	2	682	777	0	1
Pennsylvania	36	47	--------	--------	1,958	1,005	2	4
East North Central States								
Ohio	20	28	17	76	1,386	71	4	1
Indiana	11	8	10	14	420	125	1	1
Illinois	40	24	20	13	1,827	442	7	3
Michigan	9	51	--------	3	403	630	1	1
Wisconsin	4	5	11	10	1,762	220	0	1
West North Central States.								
Minnesota	5	9	1	1	117	157	1	1
Iowa [2]	12	3	--------	--------	190	45	3	0
Missouri	14	22	10	--------	159	141	2	1
North Dakota	--------	--------	--------	--------	53	131	0	2
South Dakota	3	--------	--------	--------	98	4	0	0
Nebraska	5	4	--------	--------	59	58	0	0
Kansas	10	5	1	--------	287	106	2	1
South Atlantic States								
Delaware	2	--------	--------	--------	50	17	0	0
Maryland [2]	10	11	2	3	668	32	1	0
District of Columbia	8	1	1	--------	27	21	0	0
Virginia [3]	6	9	--------	--------	776	150	1	0
West Virginia	8	--------	12	--------	115	54	0	2
North Carolina	12	9	13	4	595	392	1	1
South Carolina	3	3	77	--------	127	194	0	0
Georgia [4]	4	6	--------	--------	61	94	0	0
Florida	9	3	--------	1	104	9	0	0
East South Central States								
Kentucky	3	6	--------	9	364	31	0	0
Tennessee	8	5	5	5	153	208	0	0
Alabama [4]	8	12	5	3	333	26	0	1
Mississippi [2]	6	3	--------	--------	--------	--------	1	0

See footnotes at end of table

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 16, 1934, and June 17, 1933—Continued

Division and State	Diphtheria		Influenza		Measles		Meningococcus meningitis	
	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933
West South Central States								
Arkansas	2	4	6	--------	5	130	0	1
Louisiana	12	7	7	12	124	18	1	1
Oklahoma [3]	2	4	21	15	59	128	2	1
Texas [4]	46	37	58	77	752	753	0	0
Mountain States								
Montana [3]	7	--------	1	1	37	20	0	1
Idaho [1]	1	--------	--------	--------	5	9	0	0
Wyoming [3]	1	--------	--------	--------	76	4	0	0
Colorado	9	2	--------	--------	470	6	1	0
New Mexico	--------	8	1	--------	81	19	0	1
Arizona	1	--------	2	--------	10	--------	0	0
Utah [2]	1	--------	4	--------	17	59	0	0
Pacific States								
Washington	1	4	--------	--------	202	83	0	0
Oregon	3	3	13	12	40	41	0	0
California	31	28	30	20	942	771	1	3
Total	430	479	344	289	17,751	9,535	41	33

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933
New England States								
Maine	0	1	17	12	0	0	2	4
New Hampshire	0	0	2	13	0	0	0	0
Vermont	0	0	11	7	0	0	0	0
Massachusetts	1	0	166	215	0	0	2	2
Rhode Island	0	0	10	20	0	0	1	1
Connecticut	0	1	41	39	0	0	1	0
Middle Atlantic States								
New York	8	2	496	449	0	0	13	20
New Jersey	2	0	114	100	0	0	4	5
Pennsylvania	3	0	338	341	0	0	7	11
East North Central States								
Ohio	9	0	396	406	1	6	16	20
Indiana	1	0	47	46	1	4	0	10
Illinois	1	1	351	208	1	5	15	12
Michigan	0	1	287	254	0	0	10	4
Wisconsin	1	0	223	02	11	8	0	0
West North Central States								
Minnesota	0	0	52	50	2	1	1	1
Iowa [2]	1	0	59	17	0	10	1	2
Missouri	1	0	28	23	8	0	10	6
North Dakota	0	0	4	6	0	1	0	1
South Dakota	1	0	6	6	0	0	0	4
Nebraska	1	0	9	4	4	8	0	0
Kansas	0	0	30	11	7	1	8	5
South Atlantic States								
Delaware	0	0	3	3	0	0	1	0
Maryland [2]	0	0	26	42	0	0	4	2
District of Columbia	0	0	5	4	0	0	1	0
Virginia [3]	2	0	20	23	0	0	12	21
West Virginia	0	0	44	18	0	0	16	5
North Carolina	2	0	18	27	0	0	4	27
South Carolina	0	0	1	1	0	0	20	30
Georgia [4]	1	0	1	3	0	0	20	37
Florida	0	0	3	1	0	0	1	5
East South Central States								
Kentucky	0	0	14	19	0	0	20	20
Tennessee	1	0	4	4	2	0	11	27
Alabama [4]	0	1	5	10	0	8	14	18
Mississippi [2]	2	0	5	3	0	0	8	8

See footnotes at end of table.

Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended June 16, 1934, and June 17, 1933—Continued

Division and State	Poliomyelitis		Scarlet fever		Smallpox		Typhoid fever	
	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933	Week ended June 16, 1934	Week ended June 17, 1933
West South Central States								
Arkansas	0	0	1	1	0	0	4	17
Louisiana	0	1	1	4	1	0	22	19
Oklahoma [5]	0	0	5	6	3	7	6	19
Texas [4]	1	1	43	13	25	20	50	52
Mountain States								
Montana [3]	1	0	1	1	2	0	0	3
Idaho [3]	2	0	-------	0	2	2	0	1
Wyoming [3]	0	0	2	4	10	0	1	1
Colorado	0	0	21	14	3	1	4	0
New Mexico	0	0	4	0	3	0	3	0
Arizona	3	1	3	8	0	0	2	1
Utah [2]	0	0	4	4	1	0	0	0
Pacific States								
Washington	2	0	42	26	3	6	2	1
Oregon	0	0	29	15	2	20	2	2
California	273	1	142	132	7	18	7	9
Total	320	11	3,134	2,705	99	121	326	334

[1] New York City only
[2] Week ended earlier than Saturday
[3] Rocky Mountain spotted fever, week ended June 16, 1934, 7 cases, as follows Virginia, 2, Montana, 3; Idaho, 1, Wyoming, 1
[4] Typhus fever, week ended June 16, 1934, 14 cases, as follows Georgia, 5, Alabama, 4, Texas, 5
[5] Exclusive of Oklahoma City and Tulsa

SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week

State	Meningococcus meningitis	Diphtheria	Influenza	Malaria	Measles	Pellagra	Poliomyelitis	Scarlet fever	Smallpox	Typhoid fever
April 1934										
Nevada	-------	2	2	-------	139	-------	0	7	0	2
May 1934										
Florida	1	24	4	63	2,305	16	0	5	0	16
Indiana	3	48	56	-------	5,036	-------	4	461	8	21
Iowa	6	25	10	1	1,432	-------	3	235	23	4
Maryland	5	24	26	-------	9,397	2	2	210	0	47
Massachusetts	4	45	-------	2	5,724	1	4	1,007	0	9
Michigan	8	57	15	4	1,617	-------	2	2,964	3	22
Minnesota	6	69	6	-------	1,225	-------	1	326	66	15
Missouri	13	116	159	111	3,137	-------	5	223	25	38
New Jersey	3	67	74	1	3,276	-------	2	791	0	14
New York	12	193	-------	5	4,984	-------	7	3,426	0	39
North Dakota	-------	7	1	-------	486	-------	0	157	2	2
Ohio	20	93	121	3	7,462	-------	5	2,961	3	35
Pennsylvania	18	226	-------	-------	8,738	-------	4	2,753	0	38
South Carolina	-------	92	845	650	1,337	163	0	10	2	41

April 1934	Cases
Nevada	
Chicken pox	45
Mumps	1
Rocky Mountain spotted fever	4
Whooping cough	11
May 1934	
Anthrax	
New Jersey	2
New York	1
Chicken pox	
Florida	143
Indiana	183
Iowa	290
Maryland	245
Massachusetts	993
Michigan	1,462
Minnesota	782
Missouri	184
New Jersey	1,816
New York	3,170
North Dakota	29
Ohio	1,650
Pennsylvania	2,542
South Carolina	128
Dengue	
North Dakota	7
South Carolina	2
Diarrhea	
Maryland	4
South Carolina	575
Diarrhea and enteritis	
Ohio (under 2 years)	11
Dysentery	
Florida	4
Maryland	7
Massachusetts (amoebic)	3
Massachusetts (bacillary)	2
Michigan	5
Minnesota (amoebic)	9
Minnesota (bacillary)	1
Missouri	30
New York (amoebic)	3
New York (bacillary)	2
North Dakota	1
Ohio	1
Pennsylvania	1
Food poisoning	
Ohio	1
German measles	
Iowa	1,163
Maryland	192
Massachusetts	148
New Jersey	1,451
New York	492
Ohio	1,449
Pennsylvania	597
Hookworm disease.	
South Carolina	66

May 1934—Continued	Cases
Impetigo contagiosa	
Maryland	3
Jaundice, epidemic	
Minnesota	11
Lead poisoning.	
Massachusetts	2
Ohio	13
Lethargic encephalitis	
Florida	1
Indiana	1
Maryland	3
Massachusetts	3
Michigan	3
Missouri	6
New Jersey	3
New York	14
North Dakota	2
Ohio	3
South Carolina	4
Mumps	
Florida	96
Indiana	53
Iowa	280
Maryland	201
Massachusetts	576
Michigan	945
Missouri	526
New Jersey	459
North Dakota	78
Ohio	497
Pennsylvania	2,516
South Carolina	196
Ophthalmia neonatorum	
Maryland	1
Massachusetts	92
New Jersey	1
New York	9
Ohio	70
Pennsylvania	9
South Carolina	13
Paratyphoid fever	
Michigan	1
New York	2
Psittacosis	
Pennsylvania	1
Puerperal septicemia	
Ohio	5
Rabies in animals	
Indiana	45
Massachusetts	31
Missouri	32
New Jersey	11
New York	[1] 1
South Carolina	47
Rocky Mountain spotted fever	
Maryland	1
Septic sore throat.	
Iowa	3
Maryland	14
Massachusetts	31
Michigan	68

May 1934—Continued	Cases
Septic sore throat—Con.	
Missouri	91
New York	120
Ohio	268
Tetanus	
Iowa	1
Michigan	3
New Jersey	1
New York	5
Ohio	3
Trachoma	
Massachusetts	3
Michigan	13
Minnesota	1
Ohio	1
Trichinosis	
Massachusetts	2
Minnesota	13
New York	16
Pennsylvania	4
Tularaemia	
Michigan	1
Minnesota	1
Missouri	5
Ohio	2
Typhus fever	
Florida	4
New York	1
Undulant fever	
Florida	2
Indiana	1
Iowa	7
Maryland	3
Massachusetts	5
Michigan	6
Minnesota	6
Missouri	4
New Jersey	4
New York	29
Ohio	4
Pennsylvania	10
South Carolina	2
Vincent's infection	
Maryland	15
Michigan	18
New York	[1] 564
North Dakota	1
Whooping cough	
Florida	94
Indiana	266
Iowa	184
Maryland	659
Massachusetts	1,318
Michigan	1,401
Minnesota	297
Missouri	801
New Jersey	904
New York	1,699
North Dakota	63
Ohio	1,742
Pennsylvania	1,891
South Carolina	565

PLAGUE-INFECTED RODENTS IN TULARE AND MODOC COUNTIES, CALIF.

The Director of Public Health of California has reported that on June 9, 1934, 6 ground squirrels from Tulare County, in the interior of California, were found to be plague infected.

On June 19, 1934, 4 ground squirrels and 1 wood rat from approximately 7 miles northeast of Alturas, Modoc County, Calif., were found to be plague infected.

[1] Exclusive of New York City.

WEEKLY REPORTS FROM CITIES

City reports for week ended June 9, 1934

[This table summarizes the reports received regularly from a selected list of 121 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table Weekly reports are received from about 700 cities, from which the data are tabulated and filed for reference]

State and city	Diphtheria cases	Influenza		Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
		Cases	Deaths								
Maine											
Portland	0	------	0	0	0	6	0	0	2	4	16
New Hampshire											
Concord	0	------	0	5	2	0	0	0	0	0	10
Manchester	0	------	------	0	------	0	0	------	0	0	12
Nashua	0	------	------	12	------	0	0	------	0	0	------
Vermont											
Barre	0	------	0	0	0	0	0	0	0	0	0
Burlington	0	------	0	21	0	2	0	1	0	7	15
Massachusetts											
Boston	3	------	0	209	16	37	0	11	1	46	196
Fall River	0	------	0	2	1	3	0	1	0	11	39
Springfield	0	------	0	0	0	2	0	2	0	5	34
Worcester	2	------	0	0	2	10	0	3	0	13	43
Rhode Island											
Pawtucket	0	------	0	0	0	0	0	0	0	0	16
Providence	0	------	0	27	6	6	0	0	1	56	67
Connecticut											
Bridgeport	0	------	0	1	1	6	0	1	0	0	33
Hartford	1	------	0	17	0	3	0	1	0	0	27
New Haven	0	------	0	0	0	2	0	1	0	12	32
New York											
Buffalo	0	------	0	43	23	18	0	4	0	18	137
New York	42	4	3	434	119	183	0	85	5	141	1,412
Rochester	1	------	0	0	3	53	0	4	0	4	82
Syracuse	0	------	0	45	8	8	0	2	0	59	55
New Jersey											
Camden	0	------	0	3	0	3	0	0	0	1	30
Newark	0	1	0	54	10	17	0	13	0	32	94
Trenton	0	------	0	46	2	13	0	2	0	0	27
Pennsylvania											
Philadelphia	12	2	1	207	23	68	0	26	3	61	479
Pittsburgh	1	1	1	287	17	44	0	5	1	33	164
Reading	2	------	0	2	2	1	0	1	0	14	29
Scranton	0	------	------	2	------	3	0	------	0	6	------
Ohio											
Cincinnati	3	2	0	2	8	26	0	6	1	11	136
Cleveland	10	8	0	377	11	73	0	12	0	68	176
Columbus	1	------	0	4	2	30	0	3	1	15	74
Toledo	1	1	1	107	2	55	0	7	1	113	85
Indiana											
Fort Wayne	4	------	1	7	4	5	0	0	2	3	34
Indianapolis	1	------	0	199	8	8	0	1	1	26	------
South Bend	0	------	0	35	2	1	0	1	0	0	18
Terre Haute	0	------	0	0	1	0	0	0	1	4	------
Illinois											
Chicago	9	2	2	771	46	227	0	50	1	146	752
Springfield	3	------	0	19	3	3	0	1	0	9	23
Michigan											
Detroit	4	------	1	131	23	68	0	20	1	73	263
Flint	16	------	0	4	3	45	0	0	0	8	26
Grand Rapids	0	------	0	3	2	5	0	0	0	3	32
Wisconsin											
Kenosha	0	------	0	10	0	7	0	0	0	1	5
Milwaukee	0	1	1	200	10	176	0	7	0	69	115
Racine	0	------	0	2	0	7	0	0	0	5	9
Superior	0	------	0	2	1	0	0	1	0	1	5
Minnesota											
Duluth	0	------	0	0	3	2	0	1	0	0	21
Minneapolis	2	------	0	45	5	23	0	3	0	21	120
St Paul	0	------	0	11	1	6	0	0	0	27	57
Iowa											
Davenport	0	------	------	9	------	0	0	------	0	0	------
Des Moines	0	------	------	25	------	5	0	------	0	0	37
Sioux City	0	------	------	103	------	0	0	------	0	5	------
Waterloo	0	------	------	0	------	0	0	------	0	11	------

City reports for week ended June 9, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Missouri											
Kansas City	1	---	0	3	14	4	0	4	0	3	125
St Joseph	1	---	0	0	5	3	0	3	0	1	38
St Louis	28	1	1	4	5	12	0	10	3	67	234
North Dakota											
Fargo	0	---	0	1	0	0	0	0	0	23	6
Grand Forks	0	---	---	0	---	0	1	---	0	0	---
South Dakota											
Aberdeen	0	---	---	22	---	0	0	---	0	11	---
Sioux Falls	0	---	---	3	---	0	0	---	0	0	9
Nebraska											
Omaha	5	---	0	24	4	14	1	3	0	2	61
Kansas											
Topeka	0	---	0	47	3	3	1	0	1	30	16
Wichita	5	---	0	25	5	1	0	0	1	10	29
Delaware											
Wilmington	2	---	0	10	0	0	0	0	1	0	---
Maryland											
Baltimore	4	1	2	528	9	20	0	11	1	87	203
Cumberland	0	---	0	4	1	2	0	0	0	0	12
Frederick	0	---	0	0	0	0	0	0	0	0	0
District of Columbia											
Washington	7	2	1	21	7	7	0	13	0	19	145
Virginia											
Lynchburg	0	---	0	99	0	1	0	1	1	15	10
Richmond	0	---	0	104	4	0	0	3	0	2	43
Roanoke	0	---	1	3	0	2	0	1	0	5	21
West Virginia											
Charleston	0	---	0	23	1	0	0	1	0	10	13
Wheeling	0	---	0	11	0	13	0	0	0	9	18
North Carolina											
Raleigh	0	---	0	18	0	0	0	0	0	30	16
Wilmington	1	---	0	19	2	0	0	0	0	20	11
Winston-Salem	2	---	0	2	0	2	0	0	0	7	14
South Carolina											
Charleston	0	4	0	12	1	0	0	2	1	13	20
Columbia	0	---	0	0	3	0	0	0	0	0	36
Greenville	0	---	0	0	2	0	0	2	0	2	25
Georgia											
Atlanta	1	---	0	3	5	1	0	6	2	11	71
Brunswick	0	---	0	7	0	0	0	0	0	0	6
Savannah	1	4	0	4	0	0	0	1	2	1	28
Florida											
Miami	0	---	0	49	0	0	0	1	0	10	22
Tampa	0	---	0	35	1	0	0	2	0	0	21
Kentucky											
Ashland	0	---	---	15	---	0	0	---	0	0	---
Lexington	0	---	0	35	1	0	0	2	0	0	18
Louisville	2	---	0	105	4	7	0	2	1	18	66
Tennessee											
Memphis	2	---	0	10	6	1	0	4	4	9	104
Nashville	4	---	1	2	4	1	0	0	0	4	47
Alabama											
Birmingham	1	1	0	30	3	0	0	6	0	4	65
Mobile	0	---	0	0	0	0	0	0	0	0	19
Montgomery	1	---	---	8	---	1	0	---	0	1	---
Arkansas											
Fort Smith	0	---	---	2	---	0	0	---	0	1	---
Little Rock	0	---	2	0	5	2	0	3	0	12	11
Louisiana											
New Orleans	7	2	2	31	10	6	0	11	0	0	141
Shreveport	0	---	0	1	3	0	0	4	0	2	39
Oklahoma											
Oklahoma City	1	13	1	3	8	1	0	0	0	0	51
Tulsa	0	---	---	1	---	2	0	---	0	10	---
Texas											
Dallas	3	---	0	---	1	2	0	1	1	19	53
Fort Worth	2	---	0	---	0	1	0	1	0	1	30
Galveston	0	---	0	0	3	0	0	0	0	0	16
Houston	5	---	0	5	4	1	1	5	0	0	70
San Antonio	0	---	2	5	6	2	0	6	1	0	93
Montana											
Billings	0	---	0	0	0	0	0	0	0	8	9
Great Falls	0	---	0	4	2	0	0	0	0	2	6
Helena	0	---	0	1	0	1	0	0	0	0	8
Missoula	0	---	0	0	0	0	0	0	0	0	2

City reports for week ended June 9, 1934—Continued

State and city	Diphtheria cases	Influenza Cases	Influenza Deaths	Measles cases	Pneumonia deaths	Scarlet fever cases	Smallpox cases	Tuberculosis deaths	Typhoid fever cases	Whooping cough cases	Deaths, all causes
Idaho											
Boise	1	------	0	3	0	1	0	0	0	3	4
Colorado											
Denver	9	31	0	382	3	6	0	5	1	32	56
Pueblo	0	------	0	14	1	4	0	0	0	8	4
New Mexico											
Albuquerque	0	------	0	11	1	0	0	5	0	10	15
Utah											
Salt Lake City	1	------	0	5	1	4	0	0	0	92	24
Nevada											
Reno	0	------	0	3	1	0	0	0	0	0	7
Washington											
Seattle	0	------	0	43	4	23	0	5	0	26	76
Spokane	0	------	0	8	1	1	0	0	0	31	28
Tacoma	0	------	0	92	0	0	0	0	0	9	14
Oregon											
Portland	0	1	0	10	3	9	0	0	0	16	68
Salem	0	------	--------	0	-------	0	0	-------	0	6	-------
California											
Los Angeles	10	14	0	27	8	44	0	21	2	49	289
Sacramento	0	------	0	5	1	5	0	0	0	7	16
San Francisco	0	1	1	295	8	4	0	8	0	10	165

State and city	Meningococcus meningitis Cases	Meningococcus meningitis Deaths	Poliomyelitis cases
New York			
New York	2	0	1
Pennsylvania			
Philadelphia	0	1	0
Illinois			
Chicago	3	4	0
Michigan			
Detroit	1	1	0
Wisconsin			
Milwaukee	2	1	0
Nebraska			
Omaha	0	1	0
District of Columbia			
Washington	1	0	0
North Carolina			
Raleigh	1	0	0
Georgia			
Savannah	0	0	3
Tennessee			
Memphis	0	1	0
Arkansas			
Little Rock	1	0	0
Louisiana			
New Orleans	0	0	1
Oklahoma			
Oklahoma City	1	0	0
Colorado			
Denver	0	0	1
New Mexico			
Albuquerque	1	1	0
Washington			
Spokane	0	0	1
Oregon			
Portland	0	0	1
California			
Los Angeles	0	0	156
San Francisco	0	0	9

Lethargic encephalitis.—Cases: New York, 1; Philadelphia, 2, Toledo, 1, St Louis, 1.
Pellagra.—Cases: Philadelphia, 4, Raleigh, 1; Charleston, S C, 2, Tampa, 1, Mobile, 1, Montgomery, 1; New Orleans, 2, Oklahoma City, 1; Dallas, 1.
Typhus fever.—Baltimore, 1 case
Rabies in man.—Dallas, 1 death.

FOREIGN AND INSULAR

CANADA

Provinces—Communicable diseases—2 weeks ended June 2, 1934.—During the 2 weeks ended June 2, 1934, cases of certain communicable diseases were reported by the Department of Pensions and National Health of Canada, as follows:

Disease	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	Total
Cerebrospinal meningitis				4					1	5
Chicken pox		9		171	295	59	44	37	64	679
Diphtheria		1		25	12	8	1	2		49
Dysentery				1						1
Erysipelas				11	5	2		2	1	21
Influenza		24		2	11	1				38
Lethargic encephalitis									1	1
Measles		35		603	80	875	52	3	5	1,653
Mumps		1	1		319	26	13	3	90	453
Paratyphoid fever					1					1
Pneumonia	1	7			19		2		12	41
Poliomyelitis				3						3
Scarlet fever	2	18	1	125	214	58	19	12	109	558
Trachoma					2				1	3
Tuberculosis	9	4	23	79	86	85	7	5	30	328
Typhoid fever			4	55	15	4	1	1	2	82
Undulant fever				2	3					5
Whooping cough		19	5	236	312	10	26	14	86	717

DENMARK

Communicable diseases—September–December 1933.—During the months of September, October, November, and December 1933, cases of certain communicable diseases were reported in Denmark, as follows:

Disease	September 1933	October 1933	November 1933	December 1933
Cerebrospinal meningitis	6	8	3	
Chicken pox	6	16	25	55
Diphtheria and croup	80	210	249	195
Dysentery	73	20	59	13
Epidemic encephalitis	6	5	8	6
Erysipelas	295	352	374	282
German measles	5	2	4	10
Gonorrhea	924	956	963	715
Influenza	4,165	4,035	5,151	5,113
Malaria	10	6	5	8
Measles	102	140	137	74
Mumps	187	276	494	772
Paratyphoid fever	43	13	8	1
Poliomyelitis	83	74	40	28
Puerperal fever	9	19	19	13
Scabies	615	906	1,026	691
Scarlet fever	344	572	617	402
Syphilis	74	43	66	34
Tetanus, neonatorum	2	3	2	
Tetanus, traumatic	2	1		1
Typhoid fever	22	18	12	4
Undulant fever (Bact abort Bang)	47	60	42	34
Whooping cough	524	545	646	652

ITALY

Communicable diseases—4 weeks ended January 7, 1934.—During the 4 weeks ended January 7, 1934, cases of certain communicable diseases were reported in Italy, as follows:

Disease	Dec 11-17, 1933		Dec 18-24, 1933		Dec 25-31, 1933		Jan 1-7, 1934	
	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected	Cases	Communes affected
Anthrax	20	16	22	18	18	18	21	19
Cerebrospinal meningitis	13	5	4	4	5	5	12	12
Chicken pox	241	97	319	104	251	81	237	98
Diphtheria and croup	638	332	576	350	679	330	581	318
Dysentery	2	5	2	2	6	3	5	3
Lethargic encephalitis	------	------	------	------	------	------	2	2
Measles	1,413	228	1,197	181	1,083	171	1,451	218
Poliomyelitis	4	4	4	4	4	4	1	1
Scarlet fever	282	157	284	154	365	124	280	135
Typhoid fever	207	221	335	186	251	146	287	156

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

From medical officers of the Public Health Service, American consuls, International Office of Public Hygiene, Pan American Sanitary Bureau, health section of the League of Nations, and other sources The reports contained in the following tables must not be considered as complete or final as regards either the list of countries included or the figures for the particular countries for which reports are given

CHOLERA

[C indicates cases, D, deaths, P, present]

Place		Oct 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Dec 31, 1933–Jan 27, 1934	Jan 28–Feb 24, 1934	Week ended—													
						March 1934					April 1934				May 1934				June 2, 1934
						3	10	17	24	31	7	14	21	28	5	12	19	26	
China: Fort Bayard	C																		1
India	C	7,571	8,161	4,458	4,462	1,207	1,872	2,029	1,892	2,335	224	2,290	2,432						
	D	3,293	3,799	2,439	2,069	506	813	910	897	1,227	104	1,096	1,132						
Bombay Presidency	C	1,100	1,204	434	263	42	20	21		24	73		192	233	250				
	D	594	639	231	128	27	7	13		11	41		90	131	126				
Bombay	C	1	4	1							3		2	2	2			5	1
Calcutta	C	55	63	78	126	40	40	108	82	111	124	129	180	141	141		158	166	105
Chittagong	C		4	2			3	1			3	1		3	2	5	6	3	
Madras Presidency	C	1 039	2,708	1,344	749	151	237	170		91	59	103	129	216					
	D	453	1,012	552	290	66	101	60		59	26	35	77	134					
Madras	C	6	121	16	15		2	1	1									1	
	D	4	56	6	6		1		1										
Rangoon	C						1					1						1	
India (French):																			
Chandernagor	D				2						3	5	2	1	2				
Karikal	C		2	5															
Pondichery	C										1			1					
India (Portuguese)	C			1						1									
Indo-China (see also table below):																			
Pnom-Penh	C															1			
	D																2		
Rachgia	C								1										
Philippine Islands																			
Antique Province	C	8	8																
	D	6	6																
Bohol Province	C	173	140	292	220	62	49	13	12	3	2								
	D	101	94	200	142	41	26	7	6	4	2								
Cebu Province	C	71	75	34	1					1									
	D	45	54	30	1					1									
Cebu	C	17		1	1														
	D	8		1	1														
Naga	C	18	4	2															
	D	9	3	1															

Iloilo Province	C	2		1															
	D	3		1															
Iloilo	C	2																	
	D	3																	
Occidental Misamis Province	C				1														
Occidental Negros Province	C		9	27	13			2	34	12	3								
	D		6	23	11			1	19	11	3								
Oriental Negros Province	C		6	96	47	12	13	5	2	1									
	D		6	52	34	7	6	5	5	1									
Samar Province	C							18											
	D							18											
Siam	C				1										1	1		1	
Bangkok	C				1														
On vessels:																			
S.S. *Chycbassa* at Calcutta	C							1											
S.S. *Narbada* at Singapore from Calcutta	D											1							

Place		December 1933			January 1934			February 1934			March 1934			April 1934			May 1-10, 1934
		1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-28	1-10	11-20	21-31	1-10	11-20	21-30	
Indo-China (French) (see also table above)																	
Cambodia [1]	C					2	2	1	1				1	2	4	4	1
	D					1		1	1				1	2	2	3	1
Cochin-China [2]	C	2	1	1		1	2	1	1	4	1	5	10	3	2		6
	D	2	1	1		1	2	1	1	3	1	5	8	2	2		6

[1] Includes 4 imported cases.
[2] Reports incomplete

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE [1]

[C indicates cases; D, deaths, P, present]

Place		Oct 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Dec 31, 1933–Jan 27, 1934	Jan 28–Feb 24, 1934	Week ended— March 1934: 3	10	17	24	31	April 1934: 7	14	21	28	May 1934: 5	12	19	26	June 2, 1934
Angola [2]																			
Argentina (see also table below).																			
Buenos Aires Province	C				1														
	D				1														
Santiago de Estero Province [3]																			
Azores Ponta Delgada (see also table below)	C			4															
	D			1															
Belgian Congo. Stanleyville Province	C												1						
Bolivia. (See table below.)																			
British East Africa (see also table below):																			
Kenya	C	37	21	19	7		2		2										
Tanganyika	D	1					4												
Uganda	C	81	77	44	27	4	2	6	1	4	5	3	3	4	8				
	D	79	72	42	27	4	1	6	1	4	4	3	3	4	6				
Ceylon: Colombo	C		1	1	2	1		2	3		3	3	2	4	3	2	2		
	D		1	1	2	1		2	3		1	4	1	4	4	1	2		
Plague-infected rats			1	3	4		1						1	1		1			
China:																			
Fort Bayard [4]																			
Manchuria [5]																			
Tanghai Island	C																		7
Dutch East Indies West Java	C	1,568	1,671	1,960	2,106	609		520	499										
	D	1,560	1,576	1,955	2,104	609		518	498										
Egypt:																			
Alexandria	C		1																
Asyut	C			1	4				1	2	2	17	5	2	16	2	3	1	1
Faiyum	C			1			1							1	1				
Gharbiya	C			1												1			
	D			1															
Girga	C				3														
France: Marseille—Plague-infected rats		1																	
Hawaii Territory [6] Hawaii Island—Hamakua—Plague-infected rats		2	5	1															

India	C	11,037	12,687	16,894	17,597	4,808	6,365	4,015	4,010	3,644	3,203	3,416	2,644						
	D	5,921	7,338	10,915	11,534	3,110	4,633	2,838	2,926	2,586	2,380	2,718	2,155						
Bassein	C		1	5	3	3	3	3	1		1	2	2	2		1	2		
Plague-infected rats			2		1	1	2					2							
Bombay Presidency	C	5,799	5,501	4,906	4,871	841	837	478		489	334		140	143	134				
	D	3,621	3,555	3,235	3,111	573	541	346		347	220		116	89	87				
Bombay	C	1	1	1	17	1	1	1	2	4		2	2			2	1		
Plague-infected rats		8	1		9	2	4	10		2	1		16			1	1	1	1
Poona	C	61																	
	D	53																	
Calcutta	C		1[7]																
	D		1[7]																
Delhi	C													1					
Madras Presidency	C	537	676	881	499	145	134	82		33	11	11	7	10					
	D	257	317	497	290	76	69	51		25	9	12	4	3					
Rangoon	C	1			7				1	2		1	1	1		2		1	1
Plague-infected rats		2	3	1	4	3	1					1		1	2		1		
India (Portuguese)	C				2		1	5											
Indo-China (see also table below)[4]																			
Pnom-Penh	D		1	1	1					2							2		1
Saigon and Cholon	C			1						1						2			
Iraq Baghdad	C	2	5	1	2		1											1	1
Libya	C		11	2															
	D		6	1															
Madagascar (See table below)																			
Peru (See table below)																			
Portuguese West Africa	C				P														
Senegal. (See table below)																			
Siam	C				3		1	1			4	1		1	1				
South-West Africa.[8]																			
Union of South Africa.																			
Cape Province	C	18	3																
Orange Free State	C		1	13			1				5								
Transvaal	C		1																
United States. California[9]—Plague-infected ground squirrels—																			
Kern County										17	11	36	8	9	2	5	19		
Santa Clara County			1																
Tulare County[10]										10	7	27	9		5	7	18	3	
On vessel. At Tuticorin from Colombo	C				1														

[1] Including plague in the United States and its possessions
[2] During December 1933 and January 1934, 32 cases of plague with 17 deaths were reported in Angola
[3] A report dated May 17, 1934, states that 15 deaths from plague occurred up to that date in Santiago de Estero Province, Argentina
[4] During the week ended June 2, 1934, suspected cases of plague were reported in Fort Bayard, Kwang-Chow-Wan Territory, China
[5] A report dated Nov. 13, 1933, states that plague was reported in Manchuria, China, as follows Fengtien Province, 249 cases, Hsingan Province, 200 cases, Jehol Province, 81 cases; Kirin Province, 479 cases
[6] 1 case of human plague occurred in Paauilo, Hamakua District, island of Hawaii on June 1, 1934
[7] Imported
[8] 116 cases of plague with 5 deaths were reported in Ovamboland, South-West Africa, from Jan 1 to Dec 2, 1933 Antiplague measures have been taken.
[9] For the week ended June 23, 1934, 4 plague-infected ground squirrels and 1 plague-infected wood rat were reported in Modoc County, Calif.
[10] For the week ended June 9, 1934, 6 plague-infected ground squirrels were reported in Tulare County, Calif.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

PLAGUE—Continued

[C indicates cases, D, deaths, P, present]

Place		November 1933	December 1933	January 1934	February 1934	March 1934	April 1934
Argentina (see also table above)	C	4				1	
	D	1					
Azores (see also table above)	C				5	1	
Bolivia	C	5					
British East Africa (see also table above).							
Kenya	C	36	14	19			
Uganda	C	83	63	49	24	14	
Indo-China (see also table above)							
Cambodia	D	2	1	2	4	17	6
Cochin-China	C		1	1	1	1	
Madagascar	C			249			
	D			236			
Peru	C	19	12	7	6	10	6
Senegal							
Dakar [11]	C	15	3	1	2	6	19
	D	10	3	1	2	6	16
Medina [11]	C	1	1				
	D	1	1				
Thies [11]	C					2	10
Tivouane [11]	C						13

[11] Reports incomplete.

SMALLPOX

Place		Oct. 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Dec 31, 1933–Jan 27, 1934	Jan 28–Feb 24, 1934	Week ended— March 1934 3	10	17	24	31	April 1934 7	14	21	28	May 1934 5	12	19	26
Algeria																		
Algiers Department	C	1		2	1			2			2				1			
Constantine Department	C			1							1							
Arabia Oman Sultanate—Muscat (see also table below)	C						5											
Belgian Congo (see also table below)	C			4														
Bolivia (See table below)																		
Brazil																		
Porto Alegre (alastrim)	C	1	1	1														
Santos	C		4	2														
British East Africa																		
Kenya	C			67	742	12		[1] 467	4	71	23	4	10	9		6		
Tanganyika	C	202	71	39	50		19	8	25	4	22	15	7	22		2		
British Somaliland	C			18	13	7		8		4	2	4	1	4		[1] 2		
British South Africa																		
Northern Rhodesia	C		116	1														
Southern Rhodesia	C			1	1							12						
Bulgaria	C															6		
Canada:																		
Alberta	C		1															
British Columbia	C								1		[2] 1	1	1					
Manitoba	C						[1] 1											
Ontario	C	1		[1] 1														
Prince Edward Island	C		[1] 1															
Quebec	C		1	1														
Saskatchewan	C				1													
Ceylon. Colombo	C	1																
China																		
Amoy	C			2					1	3	3	4	5	3	5			
Canton	C	2	6	14	7	9	9	6	5	10	3	3	2	1			1	
Dairen	C	17	127	68	170	14	18	30	34	27	33	23	27					
Hangchow	C	1	2	2	4	2	4		2	1	2				3			
Hankow	C		2				1						1					
Hong Kong	C	1	2	3	17	13	7	5	24	11	5	10	11	7	7	10		3
Kwantung Leased Territory	C			38	90	11			40		15	25	33					
Macao	D				4	2	2	3	3	3	2	4		1		1		2
Manchuria—Mukden [3]																		
Nanking	C		1		4		1		2	1	1							

[1] For 2 weeks. [2] Imported. [3] From Jan 1, 1934, to Feb 9, 1934, 140 cases of smallpox, with 17 deaths, were reported in Mukden, Manchuria, China.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths; P, present]

Place		Oct 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Dec 31, 1933–Jan 27, 1934	Jan 28–Feb 24, 1934	Week ended— March 1934: 3	10	17	24	31	April 1934: 7	14	21	28	May 1934: 5	12	19	26
China—Continued																		
Shanghai	C	17	57	108	113	43	35	35	49	26	32	29	32	26	22	12	8	14
South Manchuria Railway Zone	C			58	99	7			20			32	25					
Swatow	C	1		1	1	1				1	1				1			
Tientsin	C		1		1	2				1		1	1	1				
Dahomey. (See table below.)																		
Ecuador. (See table below)																		
Egypt:																		
Alexandria	C	3		5	3													
Aswan	C			34	24	7		5			12	6				1		
Asyut	C	7	30	7	1	2				2	2	2			4	2		
Cairo	C		1		1		1	1	2	1	1	3	7			1		1
Dakahliya	C		87	12					2									
Faiyum	C	13	3												9	1		
Gharbiya	C	7	8			5		2	1		2	2			5	5		
Girga	C		20	17	8	5		4	19	4						11		
Minya	C		32	172	105	17		30	18	8	5	6				9		
Qena	C	28	24	6	5				6	3	1					1		
Provinces	C	168	265	369	265		31	42	62	28	30	22		24	24	31		
Eritrea: Asmara	C							1										
Gibraltar	C												4					
Gold Coast	C						P											
Great Britain																		
England and Wales	C	9	27	32	67	11	5	11	5	3	6	3	3	9	2	3	4	2
Blackburn	C				20	2	1	1										
	D			1	4													
London	C	9	27	31	55	9	4	10	5	3	6	3	2	9	2	3	3	2
London and Great Towns	C	9	27	32	66	11	5	11	5	3	6	3	3	9	2	3	3	2
Greece (see also table below). Salonika	C				9	3												
Honduras: Tegucigalpa	C												2			P	P	
India	C	5 677	10,824	12,154	21,153	4,967	8,329	6,888	8,357	8,240	4,584	12,077	9,397					
	D	1,232	2,707	2,937	4,710	1,047	1,868	1,501	1,925	2,090	939	2,321	2,064					
Bassein	C	12	33	62	70	11	6	2	10	3		3	3	1				1
	D	6	11	26	21	4	4	5	5	1		2	2	1				1

Bombay Presidency	C	673	1,385	1,591	2,565	809	873	900		872	944		981	835	1,011			
	D	115	286	336	470	123	155	135		190	187		178	151	176			
Bombay	C	4	20	31	56	10	9	14	12	11	11	11	7	13	9	4	5	8
	D	3	13	11	24	5	6	6	6	5	7	5	5	11	5	2	1	3
Calcutta	C	13	75	181	366	76	55	76	87	97	90	63	59	42	48	50	31	28
	D	5	42	115	245	56	42	46	66	68	65	56	49	35	35	26	28	23
Cochin	C			12	11	1	3	5	6	5	5	4		8	2	2	3	1
Karachi	C	1	4	15	21	14	8	6	3		3	3	6	2	5	3	5	1
Madras Presidency	C	2,479	2,297	3,862	4,461	2,317	2,452	2,844		1,711	1,655	2,969	2,178	1,736				
	D	447	372	711	770	360	443	405		374	266	400	367	327				
Madras	C	41	83	113	95	16	20	23	33	27	23	26		23	32	17	6	9
Negapatam	C	17	20	4				2				3		4	3	1		1
Rangoon	C	2	9	14	28	2	6	9	12	19	21	22	21	15	16	3	5	13
Tuticorin	C	6		4	6				1									
Vizagapatam	C	2	3	4	13	5	1	5	7	9	3	2	8	9	13	11	4	5
India (French)																		
Chandernagor	D			4	2				1		1	1	2					
Karikal	C	3	11	2	2	1		2	2	2								
	D	3	6	2		1			2	2								
Pondichery	C	71	93	76	122	37	32	30	56	24	41	60	17	47	23			
	D	32	50	43	59	25	14	16	27	17	22	29	18	27	19			
Indo-China (see also table below).																		
Haiphong	C			114	111	19	22	12	8	5	6	10	7	3	4	6	3	4
Pnom-Penh	C											1						
Saigon and Cholon	C		1						1									
Tourane	C													6	4	1		
Iraq	C	135	34	17	17		8					9	16	6	12	15		
Amara Liwa	C			19														
Baghdad	C	3	3	2	3	2	1				1							
Basra	C	3	1									4				2	2	1
Japan	C				29		11		6									
Kobe	C										1							
Moji	C					2				1								
Osaka	C				1	1	1			1	1	1	1		1			1
Tokyo	C			1					3		1							
Yokohama	C				2													
Lithuania (See table below)																		
Mexico (see also table below).																		
Chihuahua	D				1													
Guadalajara	D				1												1	
Jaurez [4]																		
Mexico, D F	C			2	12	1	2				5	10	4	3	3	5		
Monterrey	D	1	1		1													
Piedras Negras	C														1			
Rosita	C																	11
Saltillo	D		2															
San Luis Potosi	D			1	1							1	1		1	1		
Tampico	C			2														
Torreon	D										1			1			1	
Vera Cruz	C	1					[2] 1											

[2] Imported.

[4] Dec. 18, 1933: 90 cases of smallpox were reported in Juarez, Mexico, with 18 deaths occurring from Dec 1 to 16, 1933.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

SMALLPOX—Continued

[C indicates cases, D, deaths; P, present]

Place		Oct. 29–Nov. 25, 1933	Nov 26–Dec. 30, 1933	Dec 31, 1933–Jan 27, 1934	Jan 28–Feb 24, 1934	Week ended— March 1934: 3	10	17	24	31	April 1934: 7	14	21	28	May 1934: 5	12	19	26
Morocco. (See table below.)																		
Nigeria	C	509	184	39	937	[1] 167		[1] 570		[1] 71		[1] 174						
Lagos	C			7	15	3	3	4	3	6	4	3	5		2	4		
Nyasaland. (See table below)																		
Palestine	C					10	2	5							2			
Persia	C	12	25															
	D	5	2															
Teheran	C	8	3	8	10											1		
	D	2	2	5	6					1				1				
Peru. (See table below)																		
Poland	C	1				1									1			
Portugal (see also table below).																		
Lisbon	C	1		5	4		1	1		2	1			1	3	2	1	2
Oporto	C	2			2								3					
Salvador	C													[1] 42	26		30	
Siam	C			1						4				[5] 24	5			
Sierra Leone	C	578	260	143	189	[1] 76		[1] 105		[1] 248		[1] 20		[1] 20				
Spain	C	40		23	9	6	8	6	5	26	19	9			19		21	
Straits Settlements Singapore	C										1				1			
Sudan (Anglo-Egyptian)	C	15	61	34	66	14	25	6	40	5	16	2	1					
Syria:																		
Beirut	C		20	61	45	7				1					2			
Provinces	C	35	44	101	38			12	6	11	19	5		31	15	4	12	
Turkey. (See table below)																		

[1] For 2 weeks.

[5] For 4 weeks.

On vessels

S.S. *Rhona* at Penang from Madras	1 case	Nov 2, 1933
S.S *Enterprise* at Karachi	1 case	Dec. 5, 1933
S S. *Jaldurga* at Rangoon from Gogalpore	1 case	Dec 6, 1933
S.S. *Pembrokeshire* at Hong Kong	Present	Dec. 10, 1933
S S. *Cremer* at Singapore from Penang and Belawan	1 death	Dec 28, 1933
S.S *Jufuku Maru* at Chefoo from Dairen	Present	Jan 7, 1934
S.S *Haiching* at Amoy	Present	Jan 19, 1934
S.S. *Elysia* at Suez from Bombay	1 case	Jan 31, 1934
S S *Red Sea* at Colombo from Singapore	2 cases	Jan 31, 1934
S S. *Talamba* at Rangoon from Calcutta	1 case	Feb 9, 1934
S S. *Jaldurga* at Rangoon from Gogalpore	1 case	Feb 14, 1934
S S *Neuralia* at Shanghai	1 case	Feb 14, 1934
S.S *Varsova* at Karachi from Bombay	1 case	Feb 17, 1934
S S *King City* at Victoria	2 cases	Feb 19, 1934
S S. *Alice Moller* at Shanghai	1 case	Feb 20, 1934

On vessels—Continued

S S *Ranpura* at Bombay from Shanghai	1 case	Feb 26, 1934
S S *Minnie Moller* at Shanghai	1 case	Feb 27, 1934
S S *Shantung* at Hong Kong	Present	Mar 2, 1934
S S *Pronto* at Hong Kong	Present	Mar 12, 1934
S S *Ekma* at Rangoon from Calcutta	1 case	Mar 17, 1934
S S *Norviken* at Hong Kong	Present	Mar 17, 1934
S S *Sandviken* at Hong Kong	Present	Mar 22, 1934
S S *Moldavia* at Port Said from Bombay	1 case	Mar 26, 1934
S S *Hydrangea* at Hong Kong from Swatow	1 case	Mar 28, 1934
S S *Yuen Sang* at Hong Kong from Swatow	1 case	Apr 3, 1934
S S *Ramsay* at Singapore from Valdivostok	1 case	Apr 27, 1934
S S *Talma* at Moji	1 case	Apr 27, 1934
S S *Kut Sang* at Hong Kong from Amoy	Present	May 9, 1934
S S *Tynegarva* at Hong Kong	Present	May 16, 1934
S S *Britannia* at Port Said from Liverpool	1 case	May 31, 1934

Place		November 1933	December 1933			January 1934			February 1934			March 1934			April 1934
			1-10	11-20	21-31	1-10	11-20	21-31	1-10	11-20	21-28	1-10	11-20	21-31	1-10
Dahomey	C	23													
	D	12													
Indo-China (see also table above)	C	57	54	65	63	92	99	124	113	145	231	201	255	241	172
	D	18	10	12	7	14	14	27	26	32	27	20	24	20	26

Place		November 1933	December 1933	January 1934	February 1934	March 1934	April 1934
Arabia (see also table above)	C		20				
	D		14				
Belgian Congo (see also table above)	C			126	178	148	
Bolivia	C	39	21			42	
Ecuador	C			4		[2] 3	
Greece (see also table above)	C	2			3		
Ivory Coast	C					36	
Lithuania	C			49			
Mexico (see also table above)	C		7				
Morocco	C	16		1	1	2	19
Nyasaland	C	391	132	263	83	115	
Peru	C	21	25	19	20	33	
Portugal (see also table above)	C	323	128	111	90	78	
	D	21	16	19	15	15	
Turkey	C	12	17	23	16		

[2] Imported.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER

[C indicates cases, D, deaths, P, present]

Place		Oct. 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Dec 31, 1933–Jan 27, 1934	Week ended—															
					February 1934				March 1934					April 1934				May 1934		
					3	10	17	24	3	10	17	24	31	7	14	21	28	5	12	19
Algeria:																				
Algiers Department	C		9				1	3			6	6			6		7			
Constantine Department	C	8	7	11	5	3	5	9		1 39	8	4		5	4	5	6	2	14	12
Bone	C	1		2											1					
Philippeville	C							1												
Oran Department	C		1							2		2	2		1			1		3
Australia Sydney	C										1									
Basutoland. (See table below.)																				
Belgian Congo [2]																				
Bolivia (See table below)																				
British East Africa:																				
Tanganyika	C									19										
Uganda	C	2	5	2		1		1		3	12		29		2	11	4			
Bulgaria	C	3	8	25	16	15	11	12	11	3	3	10	15	15	12	4	7	9	15	
Chile	C	2,764	2,714																	
Antofagasta	C		4																	
San Pedro [3]																				
Santiago	C	1,211	1,156	532	98	78	61		73	37	24	34								
Valparaiso	C	54	58	15	3	4	2	7	5	3	1			3		4	3	2	1	
China:																				
Hankow	C	1	1																	
Harbin	C					1														
Kwantung Leased Territory	C		4																	
Nanking	C									1			1	1		1		2		
Shanghai	C	1	3				1													
South Manchuria Railway Zone	C			3			1	2	3						1					
Tientsin	C																1	1		
Chosen. (See table below)																				
Czechoslovakia (See table below.)																				
Egypt:																				
Alexandria	C		2	4				2	1	7	2	3	1		2	2	5	1		1
Asyut	C	1	1																	7
Beheira	C	43	113	150	71	70		138		180	160	137	131		165			117	112	113
Cairo	C							1	1	4	1	1		4	2	2	1	3	1	2

Dakahliya	C	7	14	85	17	36			32			44	50		27			49	43	47
Damietta	C		1						1	12	1	3	3	5	2	1	4	2		
Gharbiya	C	20	105	227	-78	55		36	106	65	132	85	138		62			152	74	102
Girga	C			4	2			1	12	1										1
Minufiya	C	5	26	60	56	58		88	94	89			92		102			47	42	38
Port Said	C											2			1					
Qena	C	6	2																	
Provinces	C	108	278	644	226	219	271	284	351	387	431	381	427	394	405		472	388	313	386
Greece (See table below)																				
Guatemala (See table below.)																				
Hungary	C	10				9	1	3	7	1	3	1								
Iraq																				
Baghdad	C														17	3	3			
Kirkuk Liwa	C														30	19	19	14		
Ireland, Northern. Londonderry	C		1																	
Irish Free State																				
Kerry County—Dingle	C	4																		
Killarney	C					1	1													
Roscommon County—Castlerea	C		3																	
Waterford County—Lismore	C											1	1							
Japan																				
Aomori Prefecture	C			13				2												
Osaka	C	1																		
Lithuania	C		33	44	21	14	15	8	12	6	4	18	7	12	32	12	6	5	5	2
Mexico (see also table below)																				
Mexico, D F	C	46	46	83	18	18	24	18	27	28	25	17	3	30	27	12	10	14	21	
San Luis Potosi	D			1								2	1							
Torreon	C	3																		
Morocco (see also table below)	C		7	4	1	9		12	20	20	10	6	5	17	17	19	16	10	8	8
Palestine	C	4	2																	
Persia	C	11	3	12	4	12	19	30	21	28		38	32	19		38	19	41	58	
Teheran	C			12	2	2	5	4	2	5	4	2	5	1		2	5	6		
Peru (See table below)																				
Poland	C	120	334	515	161	161	155	161	209	200	179	169	191	160	172	173	174	134	125	96
	D	10	19	34	4	15	11	8	12	19	7	12	10	12	6	9	10	8	10	8
Rumania. (See table below.)																				
Scotland	C							1										2	1	
Syria	C		15																	
Trans-Jordan	C					2	1	5	5	3	3	2		1		7	3	6		
Tunisia																				
Tunis	C			2							1					1		1		
Provinces	C				29		28	42	22	19	13	15	19	41	31	35	39	29		25
Turkey (See table below)																				
Union of South Africa (See table below)																				
Yugoslavia. (See table below)																				

[1] For 2 weeks.
[2] From Apr. 18 to May 27, 1934, 256 cases of typhus fever with 7 deaths were reported in Belgian Congo
[3] Incomplete reports from San Pedro, Chile, for the month of November 1933 show 113 cases of typhus fever.

CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER—Continued

TYPHUS FEVER—Continued

[C indicates cases, D, deaths, P, present]

Place		November 1933	December 1933	January 1934	February 1934	March 1934	April 1934
Basutoland	C	366		362	253		
Bolivia	C	39	88			79	
Chosen	C	8	4	3	1	3	
Czechoslovakia	C	12	14	7	17	123	
Greece	C	5	3	2	2		
Guatemala	C	6	5	29	16	17	26
Mexico (see also table above)	C		75	94			
Morocco (see also table above)	C	1	8	4	30	54	62
Peru	C	341	137	15	27	26	

Place		November 1933	December 1933	January 1934	February 1934	March 1934	April 1934
Portugal	C					5	
Rumania	C	35	180	399	439	492	
Turkey	C	23	27	32	24	14	41
Union of South Africa							
Cape Province	C		98	109	220	238	
Natal	C			3	19	16	
Orange Free State	C		211	297	352	339	
Transvaal	C		8	11	3	5	
Yugoslavia	C	13	66	298	357	361	

YELLOW FEVER

Place		Oct 29–Nov 25, 1933	Nov 26–Dec 30, 1933	Dec 31, 1933, Jan 27, 1934	Week ended— February 1934 3	10	17	24	March 1934 3	10	17	24	31	April 1934 7	14	21	28	May 1934 5	12	19	26
Brazil:																					
Acre Territory—Rio Branco	C		1																		
Amazonas State—Esperanca	C		1																		
Ceara State—St Mathew	C								1												
Mato Grosso State—Coronel Ponce	C																	1			
French West Africa Guinea	C		2	2																	
Gold Coast																					
Dunkwa	C			1																	
Keta	C			1																	
N'Kaw Kaw	C		1																		
Togoland	C	1																			
Ivory Coast.																					
Abengourou	C		1																		
Rubino	C																				2
Nigeria Kano	C	1																			
Senegal:																					
Birkelane	C		2																		
	D		1																		
Dakar	C	1																			
Kaffrine	C			1																	
Kaolak	C		1	[1] 1																	
Matam	C																				1
Podor	C			[1] 1																	
Sebikotane	C	1	1																		

[1] Imported.